THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

Published every Thursday Morning by David Williams Co., 14-16 Park Place, New York.

Vol. 78: No. 18. *New York, Thursday, November 1, 1906.* $5.00 a Year, including Postage. Single Copies, 15 Cents.

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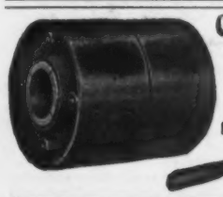

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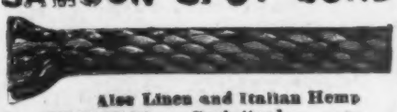

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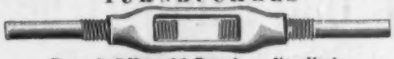

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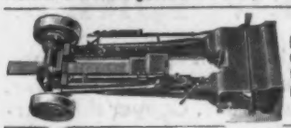

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Adv., Page 16

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THE IRON AGE

New York, Thursday, November 1, 1906.

Heavy Duty Rolling Mill Engines.

Description of the Three Installed in the Jones & Laughlin Steel Company's No. 15 Structural Mill by the C. & G. Cooper Company.

Until recent years the Corliss engine has been considered by some too refined a type for heavy rolling mill service. Originally Corliss engines were generally built for lighter service, in which close regulation and high fuel economy were the important factors. As a result of the steady increase in steam pressure, higher rotative speed and their wide use in electric railway and rolling mill work, this type of engine has been practically redesigned and greatly simplified to meet the severe requirements of these new conditions. Experience has shown that when properly built it requires less expense to maintain it through a long period of years than almost any other type of engine. The increasing cost of fuel has also been an important element in its favor. On account of its reliability and economy in the use of steam the heavy duty Corliss engine has steadily gained in favor among the leading mill engineers, until it is now recognized as standard for all classes of rolling mill work.

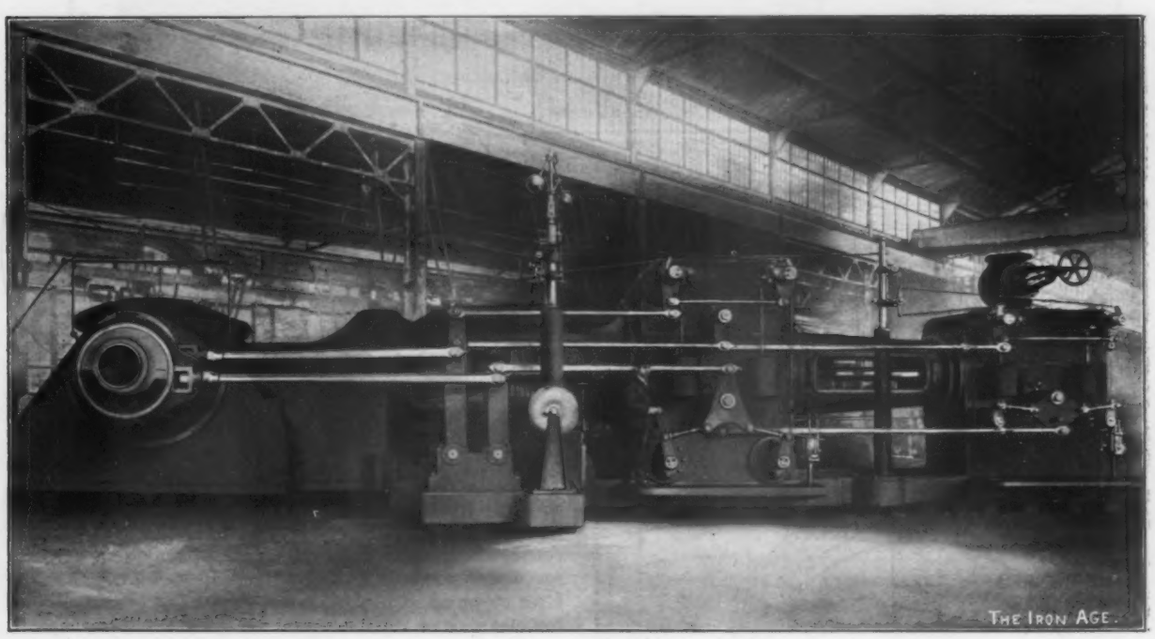


Fig. 1.—The 42 and 74 x 54 In. Roughing Mill Engine in the Erecting Shop of the C. & G. Cooper Company, Mt. Vernon, Ohio.

One of the most interesting features of the new continuous structural mill recently placed in operation at the South Side Works of the Jones & Laughlin Steel Company* is the engine equipment. The three engines that operate this mill were designed and built by the C. & G. Cooper Company, Mount Vernon, Ohio. They represent the most modern practice in engine design for this class of work and are of the tandem compound condensing Corliss type. The short time in which these engines were built was very remarkable Two of the engines were shipped in 70 days after receipt of order, and the third, a 5000-hp. machine, in less than 90 working days. The last named engine was an odd size and had to be specially designed, requiring new drawings and patterns throughout. All the engines are directly connected to roll trains by steel couplings and are equipped with variable speed governors so arranged that the speed may be varied between 60 and 110 rev. per min. while in operation. The normal speed, however, is 80 to 90 rev. per min.

Fig. 1 shows the 42 and 74 x 54 in. roughing mill engine in the course of erection in the shops of the C. & G. Cooper Company, and Fig. 2 shows the same engine in more complete detail. The main shaft of this machine is of Bethlehem hollow hydraulically forged steel, 27 in. in diameter in the wheel fit and 25 in. in diameter by 50 in. long in the main journals. The flywheel is 18 ft. in diameter, weighs 200,000 lb. and is of the built-up or segmental type, as shown by Fig. 3.

The outboard pillow block is of the massive pedestal type, as illustrated by Fig. 4. This pillow block is held down by 12 3-in. foundation bolts and further locked into the foundation by a transverse rib extending across the bottom of the block. A heavy beaded edge and oil channel is cast solid with the block on all four sides to catch the oil that may drop from the journal and the bronze thrust bearing between the coupling and the pillow block. The bearing in the pillow block is the same design as that in the main bed plate, being provided with removable shells and adjusting wedges, which have full length bearing against both side gibs.

As will be seen from Figs. 1 and 2, the guide barrel has a full length support cast solid with it. This guide barrel is of extra heavy cross section and is bored in cylindrical form. The bed is of the tangye rolling mill type, with extra depth underneath the main journals to insure maximum strength and rigidity. A heavy base plate extends under the engine and unites with the bed plate in a bolted joint. This base plate is 15 in. deep, is strengthened by heavy longitudinal and transverse ribs and has a continuous beaded edge and oil channels. The cylinders and guide barrel are connected to the base plate in planed joints, ample provision being made for relieving the engine of any undue strains of expansion and contraction.

The low pressure piston floats on a hollow piston rod supported between the main and intermediate crossheads, and is a single web casting, provided with follower and self-acting steam packing ring. This piston does not

* Described in *The Iron Age*, July 5, 1906.

come in contact with the cylinder except at the packing ring. The construction of this piston will be more clearly understood from Fig. 5. An intermediate crosshead and guide barrel is provided between the high and low pressure cylinders as a support for this floating piston. This crosshead also forms an accurate connection between the high and low pressure piston rods. The piston of the high pressure cylinder is of the center ring type, with means for central adjustment, and has follower, self-acting packing ring and bull rings, which cover the entire face of the piston. These bull rings are fitted with alternate sections of composition metal and are grooved for carrying the oil, as shown by Fig. 6.

The valves are of the multiported type, ground on dead centers and polished on all wearing surfaces, which insures a steam tight fit. The steam valves of the high pressure cylinder and admission valves of the low pressure are direct driven from the rocker arms, and are

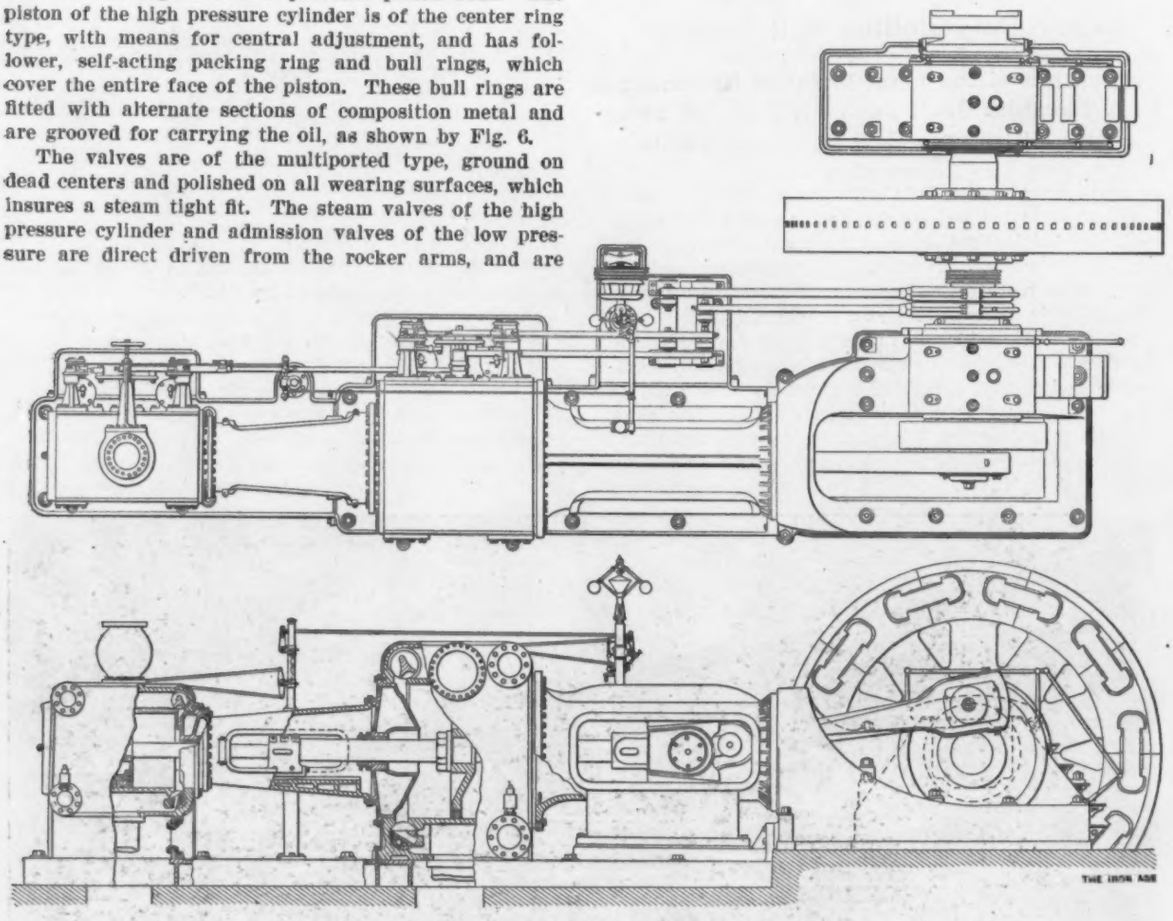


Fig. 2.—Plan and Elevation of the Engine Shown in Fig. 1.

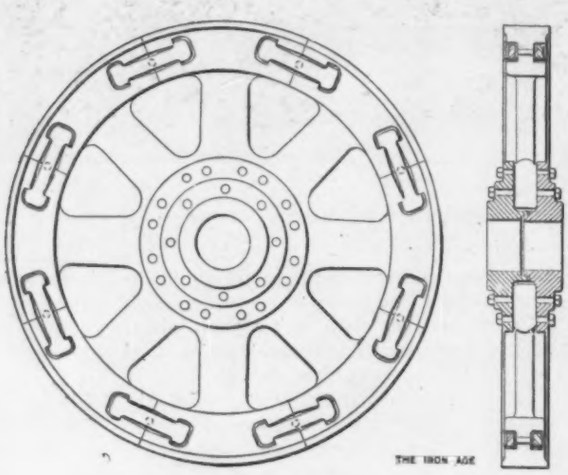


Fig. 3.—Details of the 18-Ft. Segmental Flywheel of the Roughing Mill Engine.

under control of the governor to 75 per cent. of the stroke. The vacuum pots are of the Cooper improved piston oil-sealed type. The valve gear is of steel, having all bearing surfaces lined with phosphor bronze or council metal.

The finishing rolls are driven by a 38 and 66 x 48 in. engine, having a main shaft 28 in. in diameter in the wheel fit and 23 in. in diameter by 46 in. long in the main journals. The flywheel is 18 ft. in diameter and weighs 160,000 lb. This engine throughout is similar in construction to the roughing mill engine.

The two straightening machines are driven by a 22 and 40 x 42 in. engine, which is also similar in construction to the larger engine. The flywheel on this machine in 16 ft. in diameter and weighs 60,000 lb.

The three engines are equipped with a gravity automatic oiling system, also furnished and installed by the C. & G. Cooper Company. The oiling systems for the roughing and finishing engines are of ample capacity to serve both engines and are piped up so that should the filter or pump of either system be cut out of commission for cleaning or repairs the other system may serve both engines. The cups and fittings are of the needle valve type, so constructed that the glass reservoir of the oil cup is not under pressure, but the oil supply and pressure are against the needle valve. Each cup is independent in its operation, so that in case one cup is out of order it will in no way affect the other cups of the system. The cups and fittings are so arranged that should the entire system be temporarily out of service the cups will operate as ordinary sight feed cups by simply throwing the lever on top of the cup and filling by hand. This system insures ample lubrication at all times, with a minimum expense, since all oil is caught, returned to the oil filter and used over and over again.

The engines made their trial run of nine hours up to speed the day they were started without showing any tendency to heat at any point. They have now been in successful operation about eight months, turning out a large tonnage of bars, beams, channels and other structural shapes.

A. L. Taylor, 9 California street, San Francisco, Cal., has succeeded the late S. R. Church as pig iron and coke merchant and dealer in foundry supplies and equipment. It may be noted that all the stock of Church's book, "Analyses of Pig Iron," and the plates, were destroyed in the San Francisco disaster, so that copies are no longer available.

Petroleum Production in 1905.

W. T. Griswold of the United States Geological Survey has prepared, under the supervision of Dr. David T. Day, a report on the production of petroleum, from which the following extracts are taken:

During the year 1905 the oil fields of the United States produced 134,717,580 barrels of petroleum, as against 117,080,960 barrels in 1904. This production was greater by 17,636,620 barrels than that of any previous year. The production of petroleum in the United States has more than doubled within the last six years. The increase is in the heavier grades of the fuel class, the production of lighter or illuminating oils having remained constant.

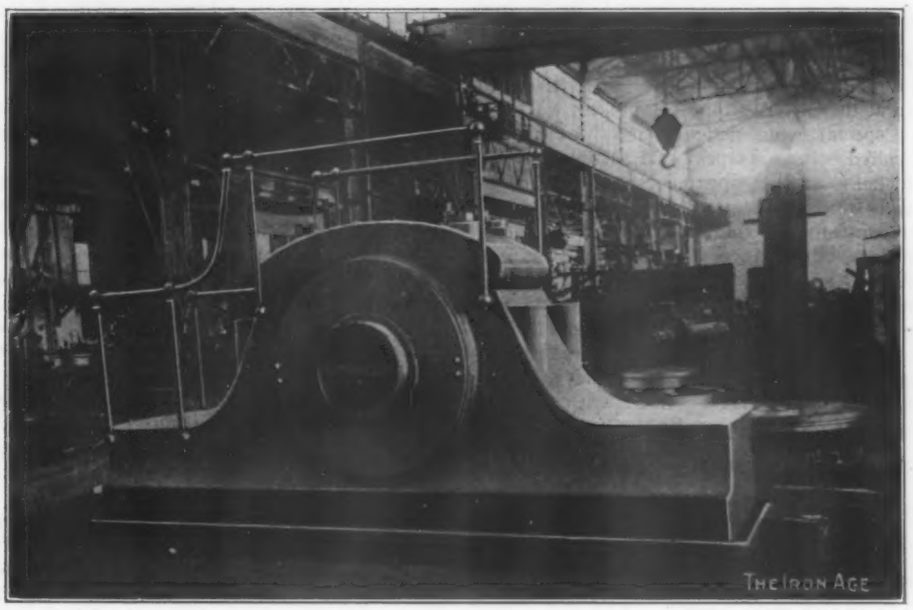


Fig. 4.—The Outboard Pillow Block for the Roughing Mill Engine.

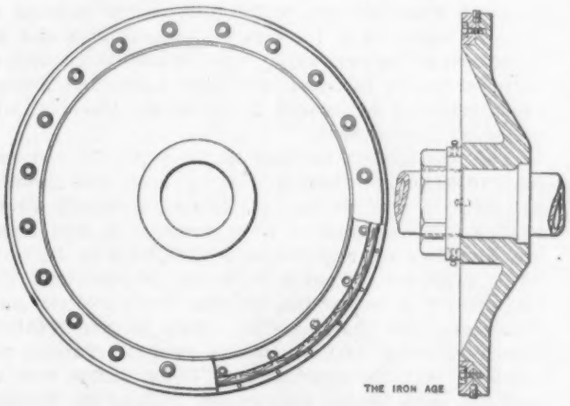


Fig. 5.—Details of the Low Pressure Piston.

It is significant, however, that the value of the oil production for the year 1905 was $17,018,056 less than for the year 1904. The 117,080,960 barrels of oil produced in 1904 were valued at $101,175,455, whereas the 134,717,580 barrels of 1905 are rated at only $84,157,399.

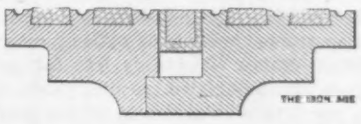


Fig. 6.—Sectional Detail of the Bull Rings of the High Pressure Piston.

A simple statement of the number of barrels of petroleum taken from the earth each year no longer shows the condition of the business. The kind and quality of the oil produced must now be taken into consideration in order to understand the relation of production to demand and consumption.

Of the production of the year 1905 70,474,078 barrels are from the Gulf and California fields. This is almost exactly the quantity by which the production of the year 1905 exceeds that of the year 1900. The petroleum of the Gulf and California fields is of the heavier variety and has a residue of asphaltum. Oil of this quality, although capable of producing a small percentage of illuminating oil, is principally valuable as a fuel. The consumption of heavy oils must therefore depend on the demand for this kind of fuel. The growth of this demand is bound to take time.

The present price of petroleum of the Gulf and California type is no determination of its value. For a period of five years the production in this quarter has been faster than the rate at which the commercial world could adjust itself to the use of the new fuel. It is improbable that this great increase in production can go on indefinitely, and as the steady increase in the consumption of oil for heat making purposes is an assured fact an adjustment between production and consumption must needs come soon.

The consumption of illuminating oil from 1894 to 1903 slightly exceeded the production. The stocks held by the large pipe line companies, which amounted to 33,772,823 barrels at the end of the year 1897, were reduced to 20,772,823 barrels at the end of the year 1903. During the year 1904 there was a consumption of 55,968,171 barrels against a production of 61,715,278 barrels, and in 1905 a consumption of 60,875,677 barrels against a production of 63,855,710 barrels. These two years caused an increase in the stocks held of 8,717,140 barrels.

The rank of States in the production of petroleum varies according to whether the standard of rank is the quantity or the value of the oil produced.

The largest quantity of oil produced by any State in the Union is to the credit of California, which produced 33,427,473 barrels of oil in 1905, or 24.81 per cent. of the total output. Next comes Texas, with 28,136,189 barrels, or 20.89 per cent. of the total, and third Ohio, with 16,346,660 barrels, or 12.13 per cent. of the whole.

When the States are arrayed in the order of value of production the positions are materially changed. Ohio, with a production valued at $17,054,877, or 20.27 per cent. of the total value, stands first. West Virginia, which is fifth in the matter of quantity, with an output worth $16,132,631, or 19.17 per cent. of the whole, stands second and Pennsylvania, with oil valued at $14,653,278, or 17.41 per cent. of the total value, comes third, while California drops to the fifth place, with oil valued at $8,201,846, or 9.74 of the total.

The Bethlehem Steel Company's Recent Extensions.

The New Saucon Plant and the Special Shapes to Be Rolled.

Extensive additions and improvements are being made to the Bethlehem Steel Company's works at South Bethlehem, Pa., among which the most important is a new plant consisting of open hearth furnaces, structural mills and rail mill. This will be known as the Saucon plant and is located at the eastern end of the present works. It will produce special wide flange rolled beams, rolled girders and rolled column shapes of H section and open hearth and nickel steel rails, open hearth billets, I-beams, channels, angles and other standard structural shapes. The company contemplates and has arranged for the expenditure of $12,000,000 to cover the cost of the new plant, including the improvements to the present blast furnace plant and raw material storage and handling facilities that will be required to meet the demand of the new open hearth plant for an increased pig iron production.

Before passing to a description of the new plant and improvements connected with it brief mention will be made of the most important recent

Additions to the Present Works

of the company, which are now about complete, but have no relation to the new plant.

A new crucible steel plant for making special high-speed tool steel and other high grade special alloys of steel is completed and in operation. There are two 30-pot crucible furnaces, a forge department with necessary hammer equipment, and a small rolling mill now under construction, which will contain a 12-in. roughing train of rolls and an 8-in. finishing mill.

A new drop forge shop, two stories, 64 x 350 ft., is completed and in operation. The equipment consists of four 5,000-lb. steam drop hammers, a number of smaller hammers, die sinking machines and necessary tools for finishing forgings. This shop, for medium size and small forgings, in connection with the older and heavy forging equipment, completes the forging capacity of the works, so that the company is now in position to make and finish a full line of forgings ranging from the smallest, under 1 lb. in weight, to the largest and heaviest forging made in the world, with a finished weight of 50 tons or more.

A machine shop expressly equipped for the manufacture of large hydraulic presses, shears, pumps, saws and all classes of special heavy machinery is just completed and in operation. The building is 122 x 350 ft., three stories high, of brick and exceptionally heavy skeleton steel construction. The middle bay is 50 ft. wide and 60 ft. high, extending to the third floor, and is used for the erection of heavy machinery. The second floor consists of two side galleries 36 ft. above the ground floor. All parts of the building are served by electric traveling cranes.

Improvements in the Present Works

now being made in connection with the new plant include increased blast furnace capacity needed to meet the requirements of the new open hearth plant, this being provided by an additional new 600-ton furnace, with stack 100 ft. high and 22-ft. bosh, equipped with electric skip hoist and having five McClure stoves 22 x 100 ft. This new furnace is now nearing completion. When it is in operation three of the present blast furnaces will be rebuilt of the same size, the construction and equipment being in every way similar to those of the new furnace, thus considerably more than doubling the pig iron producing capacity of the present plant. A circular casting machine of new design, 125 ft. in diameter, with 180 molds, is being erected to handle the additional pig iron production.

The blast furnace power plant is being increased by the addition of 10 batteries of Aultman-Taylor boilers, of 600 hp. each, arranged to burn the surplus gas from the furnaces. Three new blowing engines, 44 and 84 x 84 x 60 in., of the horizontal vertical cross compound type, having the air tubs in a vertical position, are in course of construction by the Southwark Foundry & Machine Company. A central condensing plant is being constructed to take care of these three new blowing engines, as well as the seven old ones now in operation. A Weiss condenser of large capacity, having a 72-in. exhaust connection, is being installed for this purpose. Additional electric power required for the increased demand of the blast furnace department, as well as for the increased needs of other departments of the old works, will be furnished by two new 1000-kw. electric generators driven by direct connected cross compound condensing engines. These engines will also exhaust into the new central condensing plant. A power house extension, 60 x 266 ft., of brick and steel construction, and provided with a 25-ton electric crane, will contain the new engines and generators. Ladd & Baker, Philadelphia, Pa., are consulting engineers for the blast furnace improvements.

A complete new system for handling raw material is being constructed consisting of an ore bridge of 550 ft. span and a car dumping apparatus capable of dumping two cars of material at a time. A double track elevated steel trestle ½ mile long, crossing over the existing yard tracks, is being built to connect the storage yard with the blast furnaces. Raw material will be transferred on this trestle in 60-ton electric tram cars to the storage bins at the furnaces. The storage yard will have a capacity for 550,000 tons of ore, 150,000 tons of coal and coke and 60,000 tons of stone. Hoover & Mason, Chicago, Ill., are the designers and contractors for the storage yard bins and transfer improvements.

The New Steel Works and Rolling Mill Plant

is situated about a mile east of the blast furnaces. Thirty-five-ton ladle cars will be used to transfer molten metal from the blast furnaces to the open-hearth furnaces at the new plant. Fig. 1 shows the general plan and arrangement of the new works, with an additional plant of 10 open hearth furnaces, with gas house and storage yard, indicated by broken lines, which, however, will not be built at present.

The open hearth building is 158 x 891 ft. and contains 10 50-ton open hearth basic furnaces. The furnaces will have 15 x 35 ft. hearths, with exceptionally strong binding. The erection of these furnaces is well under way and they are expected to be completed in January, 1907. A 250-ton hot metal mixer will be installed. The hot metal will be handled by two 60-ton electric ladle cranes over the charging floor. Two Morgan low-type electric charging machines will be used for charging the furnaces. On the pouring floor 70-ton ladles will be used and three 100-ton ladle cranes, built by the Alliance Engineering Company, will be employed for handling these ladles.

The gas house, 23 x 844 ft., contains 45 Laughlin gas producers, 10 ft. 3 in. in diameter by 14 ft. high, with 13½-in. lining. There are thus nine gas producers provided for each two open hearth furnaces. The gas house has overhead coal bins and is equipped with Heyl & Patterson coal conveying and ash handling apparatus.

The scrap storage yard is 84 x 900 ft., covered by three 10-ton electric cranes. Space is left for an increased scrap storage by adding two parallel yards of the same size when the future enlargement of the plant makes it necessary.

From the stripper building, which will be equipped with an electric stripper crane of 100 tons capacity, the ingots will be taken to the pit furnace building. There will be six 4-hole soaking pits commanded overhead by two 10-ton electric charging cranes. Gas will be supplied by 20 producers of the same size and type as those in the open hearth gas house. Electric buggies will convey the ingots to the blooming mill tables.

The 46-in. blooming mill is for the Grey patent beam mills and will be driven by a 40 and 66 x 54 in. twin tandem

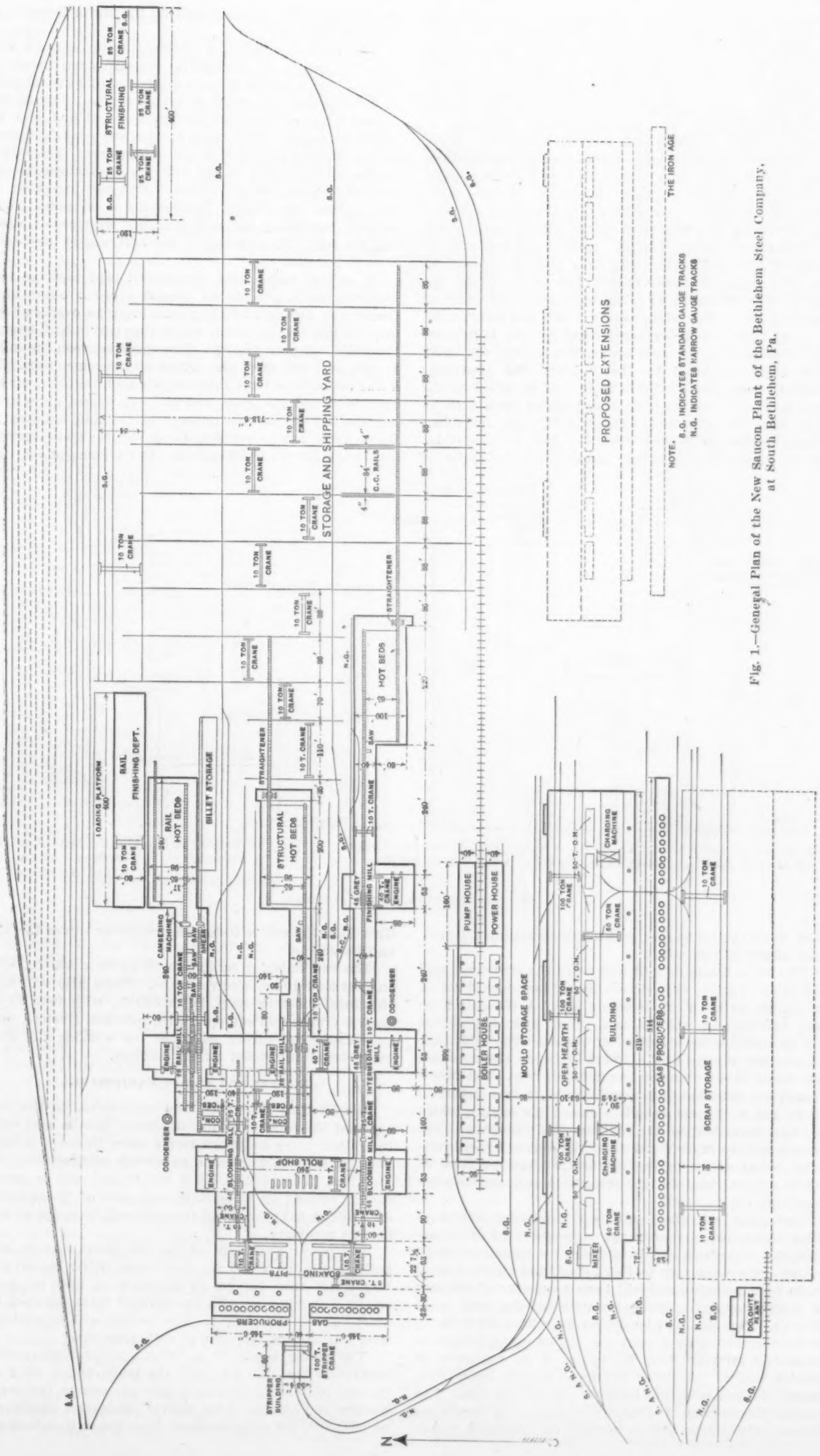


Fig. 1.—General Plan of the New Saucon Plant of the Bethlehem Steel Company, at South Bethlehem, Pa.

compound reversing engine with geared connection. A modified Wellman-Kennedy manipulator will be used. Overhead the tables are commanded by two cranes, one of 10 tons capacity and the other of 25 tons capacity. A hydraulic shear is provided for cropping the ends of the blooms. After leaving the blooming mill the blooms proceed to the 48-in. Grey intermediate mill and then to the 48-in. Grey finishing mill without reheating. These two mills are universal mills and of similar construction. They will be driven each by 40 x 66 x 54 in. twin-tandem compound reversing engines, duplicates of the 46-in. blooming mill engine except that they are direct connected. Overhead, the Grey mill tables will be commanded by two 10-ton electric cranes. Liberal hot bed area is provided for these mills. The Grey mill is expected to roll 1000 tons of beam shapes per day. From the straightener, driven roller tables extend the full width of the stock yard. The 46-in. blooming mill and the two 48-in. Grey mills are being constructed by the Bethlehem Steel Company in its own shops, the engines for these mills being furnished by the William Tod Company. Standard beams from 8 in. to 24 in. will be rolled on the Grey mill; also special wide flange beams from 8 in. to 30 in. deep, the latter with flanges 15 in. wide, and rolled column sections of H shape from 8 x 8 in. to 15 x 15 in. outside dimensions. Further mention will be made of these special rolled shapes, which will constitute the principal output of this mill.

The 40-in. blooming mill will serve the structural mill and the rail mill. It is driven by an exact duplicate of the engine for the 46-in. blooming mill. A Wellman-Kennedy manipulator will be used. Two hydraulic shears will be installed for shearing the blooms. The tables are commanded overhead by a 10-ton crane on the approach side and a 25-ton crane on the finishing side. The Mesta Foundry & Machine Company is building this mill with tables and equipment complete except the engine, which is being furnished by the William Tod Company. The blooms will be transferred from the shears by an overhead 10-ton crane to the continuous furnaces, two of which are provided for the structural mill and two for supplying the rail mill.

The 28-in. structural mill is a three-high mill with three stands of rolls, arranged to be operated as a two-high mill if desired, and is intended for rolling standard beams and channels up to 15 in. deep, and angles from 3 in. to 8 in. inclusive, and will have a capacity of 400 tons of shapes per day. Tables are provided for each stand of rolls. The mill will be driven by a 32 x 56 x 50 in. twin-tandem compound reversing engine controlled by an automatic governor when the engine is not run as a reversing engine. A 10-ton overhead electric crane commands the tables on the finishing side of the mill. The United Engineering & Foundry Company is furnishing the mill with tables, shears, hot bed, &c., complete, except the engine, which is being built by the Mesta Foundry & Machine Company.

The 28-in. rail mill is a combination three-length rail and structural mill, arranged to roll structural shapes if desired. The roughing train is driven by a 32 and 56 x 50 in. twin-tandem compound reversing engine. The finishing and intermediate trains are driven by a 44 and 76 x 60 in. Corliss engine. Both these engines are being furnished by the Mesta Foundry & Machine Company. The tables on the finishing side of the mill are commanded by an overhead 10-ton electric crane. With the exception of the engines the United Engineering & Foundry Company is furnishing the mill complete with tables, saws and hot bed. The capacity of the mill will be 1000 tons of rails per day.

It will be noted from the general plan that the two blooming mills are placed abreast of each other in a transept of the mill building containing an overhead 50-ton Alliance electric crane, which thus serves both blooming mills and their engines. The space between the mills is used as a roll shop, also served by the same crane. In a like manner the Grey intermediate mill, the 28-in. structural mill and the 28-in. rail mill are placed abreast of one another in another transept of the mill building in which there is an overhead 50-ton electric crane serving all three mills and their engines. In the transept over the Grey finishing mill a 40-ton electric crane serves the mill and its engine.

The rail finishing building will be 60 x 400 ft., with an overhead 10-ton electric crane. There also will be a structural finishing shop, 120 x 500 ft., with four 25-ton electric cranes and equipped with punches, riveters, multiple drills and facing machines for working the wide flange beam and rolled column sections.

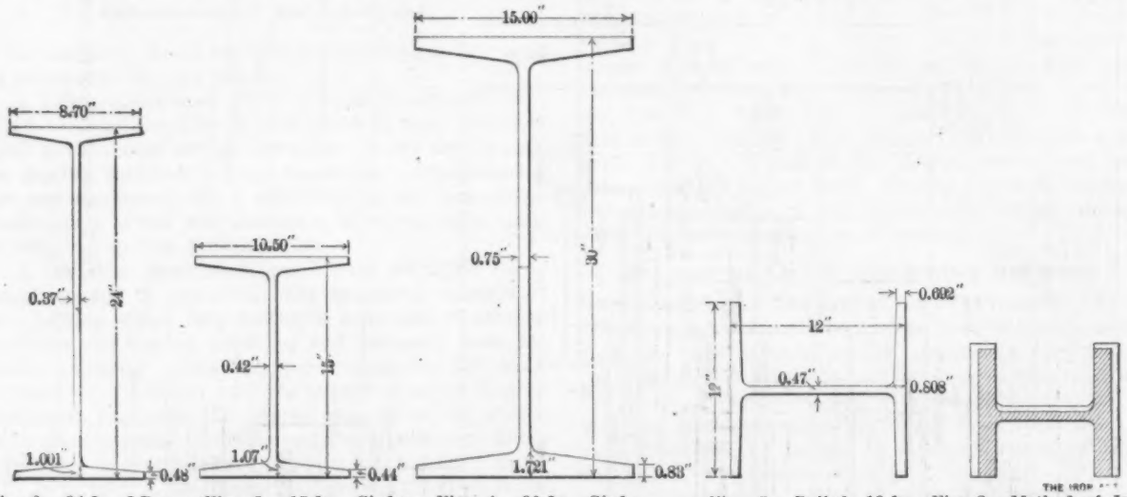


Fig. 2.—24-In. I-Beam, 72 Lb. Per Foot. Fig. 3.—15-In. Girder Beam, 73 Lb. Per Foot. Fig. 4.—30-In. Girder Beam, 200 Lb. Per Foot. Fig. 5.—Rolled 12-In. H Column. Fig. 6.—Method of Increasing Area of Rolled H Columns.

The New Bethlehem Structural Shapes.

Storage and Power Equipment.

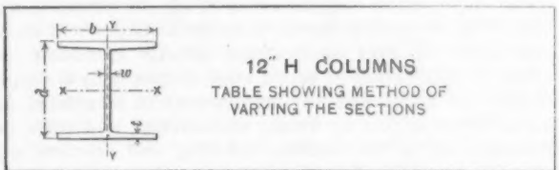
Considerable space has been apportioned to the storage and shipping yard for structural shapes and rails, the object being to afford ample room to carry a large tonnage in stock, as well as to provide adequate shipping facilities. The yard is 713 x 800 ft. and will be served for the present by 13 84-ft. cranes, each of 10-ton capacity. Additional cranes and runways will be added as they become necessary.

The power equipment of the new plant consists of a boiler house, 95 x 400 ft., containing 18,000 hp. of Stirling water tube boilers, in batteries of 1000 hp. each, set in a double row with an elevated track between for handling the coal supply. The boilers will be equipped with fan blowers for burning anthracite coal.

The power house, 40 x 160 ft., will contain electric generators for 1700 kw., and the pump house, 40 x 160 ft., will contain the hydraulic pressure pumps, feed water heaters and pumps. Two central condensing plants will be installed, the exhaust steam from the mill engines and

power engines being about equally divided between the two systems. Each system will have an independent centrifugal pump in the new pumping station at the river, driven by a steam engine, and the return water from the condensers will be utilized in return turbines which will assist these engines to drive the centrifugal pumps. A third pump and engine will be provided as a reserve. The pumping station and intake is being constructed along the Lehigh River, and besides the centrifugal pumps mentioned before will contain two Snow high duty pumps, each of 12,000,000-gal. daily capacity, for the general water supply of both the old and new works. A steel standpipe of 500,000-gal. capacity will be erected on the high ground between the two plants and connected with the water supply system of each.

Henry Grey & Son, New York City, are the consulting engineers for the entire plant. All the work on the new plant is well advanced. Practically all the foundations for the buildings and machinery are in place. The open hearth furnaces are being built. The steel work for the open hearth building, gas house, and boiler house is being erected. The steel work for the mill buildings is being furnished by the McClintic-Marshall Construction Company. When these mills are placed in operation the Bethlehem Company will re-enter the field of rail manufacture with a line of open hearth steel rails from 60 lb. upward, and will make a specialty of nickel steel and other special steels—a field from which it retired 10 years ago when it discontinued the rolling of Bessemer rails—and will for the first time enter the field of structural steel production, not only with a full line of standard structural shapes, but also with a system of special shapes that, it is claimed, will facilitate and cheapen the cost of steel construction.



12" H COLUMNS

TABLE SHOWING METHOD OF VARYING THE SECTIONS

SECTION NUMBER	WEIGHT PER FOOT POUNDS	AREA OF SECTION SQ. IN.	DIMENSIONS IN INCHES d	t	b	w	AXIS XX RADIUS OF GYRATION r'	AXIS XX SECTION MODULUS S	AXIS YY RADIUS OF GYRATION r'	AXIS YY SECTION MODULUS s'
H 12"	40.0	11.76	11⅞	⅜	8.00	.33	4.90	49.1	1.91	10.7
	45.0	13.23	11⅞	9/16	8.04	.37	4.92	55.2	1.92	12.2
	48.1	14.16	11⅞	9/16	9.00	.36	4.98	60.5	2.19	15.0
	55.6	15.75	11¾	⅝	9.04	.40	5.01	67.3	2.20	16.9
	57.4	16.89	11¾	⅝	10.00	.40	5.05	73.3	2.46	20.4
	63.3	18.61	11⅞	11/16	10.04	.44	5.08	80.8	2.47	22.7
	67.1	19.74	11⅞	11/16	11.00	.43	5.12	87.3	2.74	26.9
	73.4	21.60	12	¾	11.04	.47	5.15	96.5	2.75	29.7
H 12	78.0	22.94	12	¾	12.00	.47	5.18	102.6	3.01	34.7
	84.7	24.92	12⅛	13/16	12.04	.51	5.21	111.5	3.03	37.9
	91.5	26.92	12¼	⅞	12.08	.55	5.24	120.5	3.04	41.3
	98.3	28.92	12⅜	15/16	12.12	.59	5.27	129.6	3.06	44.6
	105.2	30.94	12⅜	1	12.16	.63	5.30	138.6	3.07	48.0
	112.1	32.96	12⅜	1 1/16	12.20	.67	5.33	147.9	3.08	51.4
	118.6	34.87	12⅜	1⅛	12.23	.70	5.36	156.9	3.10	54 8
	125.5	36.91	12⅜	1 3/16	12.27	.74	5.38	166.2	3.11	58.3
	132.5	38.97	13	1¼	12.31	.78	5.41	175.6	3.13	61.9

THE IRON AGE

Fig. 7.—Table Showing Various Sections of 12-In. H Columns.

The Grey Universal Beam Mill.

The most interesting feature of the new works will be the Grey beam mill, which is a universal mill. Instead of the horizontal grooved rolls of the ordinary beam mill the Grey mill has separate horizontal and vertical rolls. These form the web and flanges of an I-beam shape by combined rolling operations acting at right angles, thereby making it possible to produce larger and wider flanges than can be rolled by the ordinary beam mill, in which the web is the only part of the shape formed by a true rolling process and the flanges are actually formed by the crowding or dragging of the metal through the flange grooves, necessarily limiting the size of the flange.

A Grey beam mill has been in successful operation since 1902 at the Differdingen Works of the German-Luxemburgian Mining & Rolling Mill Company, near Luxemburg, Germany, producing beams from 10 in. to 30 in. in depth, with flanges from 10 in. to 12 in. wide. Such sections in regard to their shape and properties of strength have great advantages for structural work over beams of existing standard form. The wide flange beams can be used instead of riveted or built up sections for many structural purposes with an economy in weight of material or with a saving of both material and labor. Beam sections produced by the Grey mill have a uniform amount of reduction in the rolling on all parts of the shape. This is not the case in beams rolled on the ordinary mill. Especially the larger sizes of beams rolled by the usual method show great variation in quality of material between the webs and flanges, due to the difference in the work of reduction of the metal during rolling, indicating a condition of internal stress existing in the shape caused by the unequal deformation of the metal in the rolling process. Beams of all sizes and shapes rolled by the Grey mill show a uniformity in quality of material throughout the section, indicating an equality of work of reduction in the rolling without unequal deformation, and consequently, an absence of internal stress.

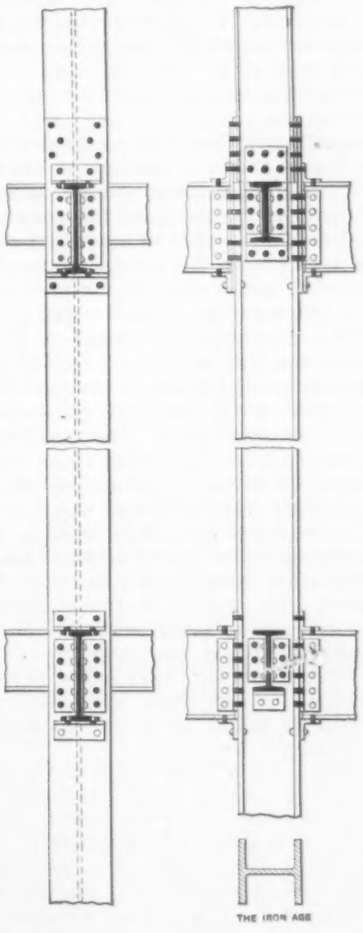


Fig. 8.—Details of Splices and Connections for Rolled H Columns.

At Differdingen the beams are finished from the blooms on a single Grey mill. At Bethlehem there will be two Grey mills—each driven by a separate engine—one mill for roughing and the other for finishing. This arrangement will obviously give an increased capacity to the mill. Not only special or wide flange beams will be rolled on this mill, but also beams of standard shape.

The Bethlehem Special Shapes

are designed to meet the requirements of American structural practice. Three distinct types of shapes will be provided, viz.: Special I-beam sections, girder beam sections and rolled column sections of H shape.

It is known to those familiar with the design of beam

shapes that the webs of the standard shapes are thicker than is required for an economical section; but with the ordinary rolling method it is not practical to reduce the thickness of the web. With the Grey mill, however, the web can be made of the desired thickness and by adding part of the metal thus saved to the flanges the strength of the section will be preserved, with the result of a diminished weight of section for the same strength. The Bethlehem special I-beams will have the same section modulus or coefficient of strength as standard beams of corresponding depth, but by reason of the better proportion and distribution of metal between web and flange the weight of the special beams will be 10 per cent. less than that of the standard sections. Fig. 2 shows a Bethlehem special I-beam 24 in. deep, weighing 72 lb. per ft. This section has the same coefficient of strength as a standard 24-in. beam which weighs 80 lb. per ft., thereby effecting a saving of 8 lb. per ft. or an economy of 10 per cent. in weight. In the relatively few cases where thicker webs are needed the section may be increased in the usual manner. For equal coefficients of strength the Bethlehem special beams will be 10 per cent. lighter than standard sections.

The Bethlehem girder beam sections up to 24 in. in depth have a coefficient of strength or section modulus equal to that of two standard beams of the same depth, but the girder beam weighs about 12½ per cent. less than the combined weight of the two standard sections. Fig. 3 shows a girder beam 15 in. deep, the weight of which is 73 lb. per ft., and which has the same coefficient of strength as two standard 15-in. I-beams, each weighing 42 lb. per ft. This girder beam weighs 11 lb. per ft. less than the two standard beams, or an economy of 13 per cent. in weight, without taking into account the saving in separators, which would add 2½ lb. per ft. to the assembled girder of standard beams. The total economy in favor of the girder beam is therefore about 16 per cent. in weight, beside the saving in cost of handling and assembling the ordinary standard beams into a girder.

Large girder beams from 24 in. to 30 in. deep will be rolled for use instead of riveted girders. Fig. 4 shows a 30-in. girder shape weighing 200 lb. per ft., the largest size of beam it is intended to roll at present. These beams of larger size than any now rolled in this country can be used to advantage as girders for buildings, crane runways, bridges and for many other purposes where otherwise riveted girders would be required, with a saving in weight or in cost of fabrication, and frequently with an economy in both items.

These special wide flange beam and girder sections may be used for columns for mill buildings and other purposes to advantage, but a separate line of rolled column sections of H shape will be provided, specially designed to fill the requirements of columns for building construction. Seven sizes of these sections will be provided, from 8 x 8 in. to 14 x 14 in., inclusive, varying by inches. Fig. 5 shows the nominal initial shape of the 12-in. H column. The section is increased or diminished in the manner shown in Fig. 6 by proportionate spreading of the rolls, an operation the mill is designed to perform mechanically. By this method, for instance, the 12-in. column section shown in Fig. 5 can be varied, furnishing a series of similar sections from 11.76 sq. in., increasing by successive increments to an area of 79.06 sq. in. without change of main rolls. The table, Fig. 7, shows part of the variation of a 12-in. column as an illustration. Thus the columns for an ordinary 12 or 15 story building can be selected with the proper areas to suit the variations of load, and by using sections of similar shape throughout, the columns for the entire building can be made at the same rolling without change of rolls, securing a promptness of delivery from the mill unobtainable in the present system of column construction, where numerous sizes and shapes are needed to cover the same range of strength. Ingots of large size will be used in the manufacture of these sections, so that the work of reduction in rolling the shapes, especially the heavier sections, shall be sufficient to develop the proper ductility of metal.

The only fabrication required for these rolled column sections is to provide for splices and connections. The shop work on a two-story length of rolled H column with details of the type shown by Fig. 8 requires only 91 holes and the driving of only 13 shop rivets. An equal riveted column made of channels and plates requires the handling of four shapes, punching 520 holes and driving 240 shop rivets to build it into an assembled shape. In the case of the rolled column with thick metal the holes require to be drilled; but as the only holes needed are for the splices and connections—generally groups of holes with similar spacing—the work can be performed economically with a gang drill making all the holes of a group at a single operation. Even in the common riveted construction with punched holes good workmanship requires that the holes for splices and connections shall be reamed to templet or with parts assembled to secure proper fitting between connecting parts. This is accomplished in the one operation when the holes are drilled. In general, from one-half to two-thirds the cost of fabrication of built-up riveted columns can be saved by the use of the rolled column sections.

The company has in preparation and will issue shortly a hand book, which will give in complete form the dimensions, weights, and properties of all the shapes it will roll. The Bethlehem special structural shapes will be an innovation in steel construction, greatly extending the range of application of rolled steel shapes with a simplification of detail and an improvement in structural design. Their saving in weight of material, and their decreased cost of fabrication, handling and erection will effect a material reduction in the cost of steel frame construction.

An Improvised Auto Truck.

The problem of handling the large amount of stock which is received mostly in small packages and at intermittent periods has been neatly solved by one of the Cleveland automobile factories, the Royal Motor Company. The factory is located about three miles from the principal freight depots and supply houses, which distance must frequently be covered for a load of only a few pounds. The waste of time and money is a matter of considerable moment, as will be appreciated when several trips are often made for small loads, the team and driver sometimes spending a whole day in making four or five trips and hauling only a few hundred pounds. Two years ago an old four-cylinder chassis that had been used in demonstrating was put in order and a box attached to the frame. An intelligent colored man was taught to run the car and it was put in service, doing errands, hauling merchandise from the freight depots, &c.

This extemporized auto-truck has brought into the Royal shop nearly 50 per cent. of all the merchandise which goes to make up the Royal cars and at about one-half the cost of horse drawn drays. It is able to make ten times as many trips as were formerly possible, costs less to keep in service and is always ready for business. In fact this car, which started as a makeshift, has become a necessity. It is to be continued in service in its present condition to determine its durability and life, the intention being to deny it repairs or attention until it fails.

The practice of slightly offsetting the center line of gasoline engine cylinders with respect to the axis of the crankshaft has been adopted by a number of the leading French automobile manufacturers. This practice is said to have originated with the Westinghouse Machine Company in 1886, when it first placed on the market its two cylinder, high speed, single acting steam engine, fitted with trunk pistons. The result of offsetting the cylinder is that the side pressure of the piston on the cylinder wall, due to the thrust of the connecting rod, is decreased during the power stroke and increased during the compression stroke. The compression pressure being much lower than the expansion pressure, the increase in side pressure during the compression stroke is of less importance than is the decrease in side pressure during the power stroke. The result should show a decrease in the wear on the cylinder.

The Sherman Antitrust Law Analyzed.

Charles G. Dawes of Chicago, former Comptroller of the Currency, made an address on the Sherman Antitrust law last week before the National Association of Life Underwriters at St. Louis, of which the following is an abstract:

The Sherman Antitrust law makes every contract in restraint of trade criminal under the law, irrespective of whether it is really criminal. An agreement in restraint of trade may be beneficial to the public. If competitors agree to compete only in the sale of pure goods as distinguished from adulterated goods, this agreement in restraint of trade is of great public benefit. Those contracts in restraint of trade which have for their object the maintenance of high standards in manufactured products, the abolition of deception in sales, the prevention of undue collections of perishable merchandise at points where the demand cannot possibly equal the supply, so that a loss and waste are the result, such contracts in restraint of trade are publicly beneficial. The contracts in restraint of trade which have for their purpose the extorting of an unreasonable price are injurious to the public and should remain under the ban of the law. But even an agreement among competitors not to sell below cost may in some instances be of public benefit, as preserving a larger area of reasonable competition. Certainly we have heard much complaint recently about the large corporations selling below cost in particular localities in order to destroy the local competitor, and thus be enabled later to exercise a monopoly and raise prices higher than ever.

Men Sometimes Combine to Exist, Not to Extort.

Certain agreements in restraint of trade are for the purpose of preventing the destruction of competition by the crushing out process of the relentless business warfare of modern times. They aim to keep the smaller business concerns in existence. Business men sometimes combine simply to exist, not to extort. So we have all over the country in different lines of business district, city, State and national associations of business men, formed for mutual protection and generally for the adoption of agreements, which in greater or less degree determine and limit the customs of trade, and many of which are technically in restraint of trade. The Sherman Antitrust law makes inherently innocent agreements as criminal as those inherently guilty. That is the reason the law has been and always will be a failure. For 16 years it has been practically a dead letter until recently an attempt has been made to satisfy the demand for correction of undoubted corporate abuses by its partial enforcement.

The Sherman Antitrust law encourages the constant incorporation into larger concerns of any number of competing concerns less than the whole number, for by this means the results of any kind of a trade agreement can be legally secured and certain powers legally exercised which the law should properly forbid. It is thus one of the worst enemies of competition, for it directly encourages the absorption by purchase of troublesome competitors. The reform needed in the law is a clearer definition of what shall constitute illegality in trade agreements and the exemption from its provisions of such agreements as are not injurious to trade. A law should no more assume that a trade agreement is criminal than the law assumes an individual guilty before trial. If competition is to be preserved, it must not be allowed to run riot. By proper amendment of the law trade agreements, whether in restraint of trade or not, might be considered by a commission in their relation to the public interest. Beneficial trade agreements should be encouraged and legally sustained and bad ones forbidden, and if consummated punished. As the law stands at present it is subject to the following objections:

Objections to the Law as It Now Stands.

1. As its principal section makes criminal, without further definition, an agreement in restraint of trade, it leaves to judicial determination the definition of the crime, and it has not yet been defined, but will only be defined as each case arises. The business community is therefore left in doubt as to what may constitute a crime under the law.

2. It makes no distinction between those agreements in restraint of trade which are beneficial to the public and those which are detrimental. An agreement among competitors, for instance, to sell only pure as distinguished from adulterated goods is presumably as criminal under its provisions as one designated solely to extort unreasonable prices.

3. Being indefinite in its definition of the crime and introducing into business an element of doubt and uncertainty as to trade agreements, it operates to the disadvantage of the scrupulous business man and in favor of the unscrupulous business man.

4. The fact that trade agreements beneficial to the public, as well as those which are injurious, may alike be criminal under its provisions discourages the formation of good trade agreements and encourages the formation of evil ones. The first, because scrupulous men desire to take no risks with the law; the second, because to unscrupulous men the risk of prosecution is less, since to include under any law good and bad acts as equally criminal inevitably discourages its enforcement.

5. The general prosecution of our leading business men for that which may not be inherently criminal or opposed to public policy, which this law makes possible, would tend to have one of two results—it might lead them either to sell out their business as a whole to men willing to take risks with the law, which would be a public injury, or it might lead them to subdivide their business and sell it out to smaller concerns, thus lessening the economies of production and distribution, which would be a step backward in our commercial evolution and a public injury.

6. The enforcement of this law giving necessarily through its general terms such wide latitude and discretion to executive officers in their right to proceed against corporations and individuals is bound to create the appearance at least of favoritism in its application, and to result in lack of uniformity in the treatment of cases arising under it.

Two Pelton wheels directly connected to 750-kw. generators and operating at 450 rev. per min. under a head of 1065 ft. are used by the Nevada Power, Mining & Milling Company to transmit power to the Goldfield and Tonopah districts of Nevada. The water wheels were sold under a guarantee to give not less than 80 per cent. efficiency. The test load was carried by a water rheostat and measurements of the power made by watt meters. Readings were also taken by volt meters and ammeters. The load was constant and the test extended over 90 min. The electric, windage and friction losses of each generator were afterward separately obtained by running it as a motor. The water pressure was measured by a gauge attached just back of the gate and proper allowance made for the small velocity head. The water was carefully measured over a weir in the tail race. It was found that the wheel delivered to the shaft of the generator a total of 82.8 per cent. of the theoretical power of the water as it entered the nozzle.

An Italian airship of the balloon type has the balloon separated into three divisions, two of which are again each subdivided into three, separated by valves. The upper main division is filled with hydrogen, the second with coal gas, and the lower one, which is used as a regulating space to allow for change of volume, with air at atmospheric pressure. The propelling power is vested in four screws of small diameter placed at the center of gravity, one pair on each side, in the same horizontal plane, and driven by gasoline engines. A feature of the airship is the provision of a pendulum regulator. Any displacement of the bow or stern out of the horizontal plane causes the pendulum to actuate a piston, compressing air, which forces water out of a tank at one end into a tank at the other end and restores the balance.

The Cutting of Steel by the Combustion Process.

BY S. D. V. BURR.

We are indebted to a Belgian engineer—Felix Jottrand, of Uccle—for the perfection of a process which, according to reports that have reached this side, is both rapid and economical and further is capable of wide application. The process depends upon the union of oxygen and iron and is founded upon the principle that

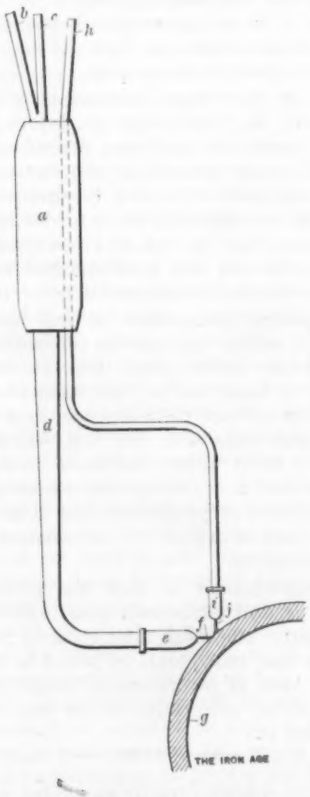


Fig. 1.—Side Elevation of Both Jets for the Cutting of Steel by Combustion.

when combustion has once been started it will continue as long as the proper conditions are maintained. More than this, when the metal has been heated to the requisite degree the temperature then may be increased by chemical action until the molten state has been attained. In other words, the union may take place with such great rapidity as to melt the metal. This method is not progressive from one chemical combination to another, as is the thermit process, but the start and finish are much nearer together.

Two elements having an affinity for each other will unite, and the violence with which the union takes place, or the combustion, as it is more generally termed, depends in most cases upon the temperature. Oxygen and iron will unite very slowly when both are cold and very rapidly when the iron is heated and the oxygen is brought into proper engagement with it. This is the principle which has been utilized by M. Jottrand. Not the least important feature of the process is its wonderful simplicity. The metal, iron or steel, is first heated along the line of cut with an oxy-hydrogen flame. Following immediately in the path of this is a jet of oxygen, and the resulting oxidization is so rapid as to reduce the metal to a fluid state; in this condition it flows freely from the cut.

According to Eugene Lemaire, who describes the process in a recent issue of *Le Nature*, of Paris, the first experiments were made with an oxy-hydrogen flame to bring the metal to a red heat; when this temperature had been reached the hydrogen supply was reduced and that of the oxygen increased, the idea being to produce combustion. It was found that this action was not violent enough; the oxidation was too slow, and the metal could not be made fluid enough to flow freely from the cut. Carried out in this manner the operation was intermittent. Combustion could only be maintained for a few seconds at a time and then the metal had to be again heated with the oxy-hydrogen jet. The kerf was of varying widths and its edges were rough, while the repeated heatings were too prodigal in the use of hydrogen.

Success was attained when two jets, one carrying the oxygen and hydrogen and the other the oxygen, were moved along the mark. The first brought the metal to a red heat and the second provided the oxygen for combustion. The first jet was kept a short distance in advance of the second. Under these conditions the heat did not have time to be dissipated and the oxide was very fluid. Rapidity of cutting was assured, as the work was continuous. The expense of cutting was reduced, as there was no waste of gases, both the oxygen and hydrogen being used under the most efficient circumstances.

It is mentioned that the section cut is as clean as that left by a saw and the kerf is not over 2 millimeters (0.078 in.) wide in a plate 100 millimeters (3.93 in.) thick. The rate of cutting is 20 centimeters (7.87 in.) per minute for a plate 15 millimeters (0.59 in.) thick. The consumption of hydrogen and oxygen for this amount of work is only a few liters (1 liter = 61.022 cu. in.) of each. The line of cutting may follow any direction desired, and variations in the character of the metal have no influence on the cutting. The process is equally applicable to hard or soft steel and has been advocated for the dressing of armor plate.

Description of the Apparatus.

Letters patent have just been issued in this country to M. Jottrand. In the specifications this method is advanced for cutting plates, pipes and other metal articles made of iron or other readily oxidizable metal. For cutting openings in pipe or plate the jets are turned about a center in sweep fashion.

It is explained that the cutting of the metal is effected by chemical action upon the heated part, "the metal being raised to such a temperature as to enable oxidation to take place without fusion of the metal, while the oxides, which are more fusible than the metal itself, flow

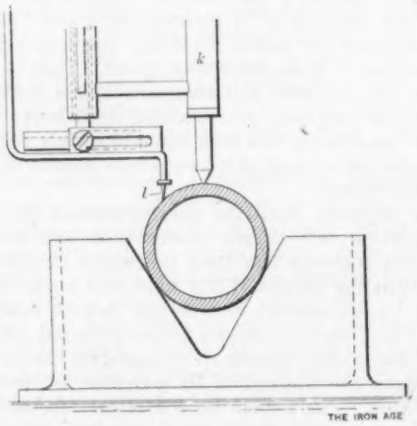


Fig. 2.—The Combustion Apparatus Adapted to Cutting Pipe.

readily and the severance is perfectly clean, as though the metal had been sawed."

The construction of the device will be understood from the accompanying illustrations, which are taken from the patent papers. When the work does not require any great degree of precision, or when the contours to be cut are quite complicated, an ordinary blowpipe is employed, indicated at *a* in Fig. 1. This is provided with separate inlets *b* and *c* for the oxygen and hydrogen which open into the mixing chamber *d*, from which leads the nozzle *e*, whence issues the heating jet *f* against the metal *g*. To this blowpipe is fixed the pipe *h*, which conducts oxygen under pressure to the nozzle *i*. This nozzle is arranged to follow closely in the path of the first, so as to direct its jet *j* upon that portion of the

metal which has been brought to the proper temperature by the flame. This jet of oxygen produces a clean cut along the line and without appreciable loss of metal.

The second drawing, Fig. 2, shows the nozzles carried by a center *k*, which is applied to a pipe. It is evident that the same arrangement can be applied to a plate for circle cutting. Extending from the center is an arm at the lower end of which is a stud engaging with a slotted bar to which the gas pipes *l* are attached. By this means the device can be arranged to cut in circles of different diameters.

Welding with the Oxy-Acetylene Flame.

The oxy-acetylene blowpipe possesses advantages peculiarly its own for the welding of metals. It requires no cumbersome and expensive apparatus, as does the welding by electricity, neither does it call for more or less intricate molds, as in the thermit process. The method as described by Andre Beltzer in the *Electrochemical and Metallurgical Industry* is extremely simple, free from all preliminary operations and inexpensive in comparison with other processes.

The necessary apparatus consists of two generators, one for acetylene, which is generated from the carbide in the usual way, and the other for the oxygen, which is generated from the newly discovered product called "epurite." The latter yields chemically pure oxygen upon the addition of water and is handled in precisely the same way as the carbide for the production of acetylene. Both of the gases are delivered to the blowpipe at a pressure of 60 in. of water, this pressure being required so that the exit speed of the gas will prevent possible back burning. The blowpipe is provided with gauze partitions to prevent back ignition.

The blowpipe is started by first turning on the acetylene and then the oxygen until the flame exhibits only one inner cone. When the flame becomes a whiter color and there are two cones it indicates an excess of acetylene and that the flame is carbureting. An oxidizing flame is shown by a violent tint and the metal (steel) boils. The first flame gives a gray porous weld, and this flame in connection with the oxidizing flame gives a brittle weld and is very rarely used. During the welding the apex of the cone should be kept from 0.08 to 0.12 in. from the metal. When the two edges have fused the space between them is slightly more than filled by the fusing of a rod of the same metal held in the flame. By this method iron, steel, copper, brass, cast iron, &c., can be successfully welded. Oxidation cannot take place, since at the high temperature of the flame the water and carbonic acid resulting from the reaction are dissociated. The temperature, 3500 degrees C., is nearly that of the electric arc, and is much higher than the oxy-hydrogen flame, which is about 2000 C.

The paper states that in general the cost of welding by this process is about 50 per cent. of the cost of ordinary riveting on work up to and including 0.28 in. thick. The cost is the same as riveting for sheets 0.32 to 0.36 in. Sheets 0.04 in. thick can be welded at the rate of 160 in. per hour, and sheets 0.6 in. at the rate of 14 in. per hour. It was ascertained by tests made by the International Bureau Veritas at Paris that the tensile strength of the weld was within 5 per cent. of that of the metal itself. The process is specially applicable to the easy and rapid repairing of all parts, particularly forged, which formerly had to be abandoned on account of flaws or cracks. It has also been used to advantage in assembling for boilers, tanks, piping, &c.

A fan blower has the peculiar function of automatically increasing the volume of air delivered as the resistances are decreased, instead of always delivering a fixed volume of air regardless of requirements. On the other hand, if the blower be operated with a fairly free outlet in excess of its capacity area, and that free area be decreased, the pressure produced will immediately rise, thus tending at once to overcome the increased resistance. Therefore if a certain maximum pressure is known to be required the fan may be speeded to give this at such times as the conditions demand, while at other times, when less pressure or volume of air is required, proper manipulation of the blast gate will economize power.

The Increasing Use of Ferroalloys.

In opening the season's work of the Franklin Institute, Philadelphia, October 18, Prof. A. E. Outerbridge, Jr., delivered an address on "Recent Progress in Metallurgy," a larger part of which dealt with the remarkable increase shown in the production of iron, steel, copper and other metals. Following is a report of his remarks on the increasing use of ferroalloys.

The use of ferroalloys in the manufacture of high speed steel for cutting tools has made great progress the past year and has been extended in various directions with remarkable results. Large and costly milling cutters are now being made of this steel, as well as planer and lathe tools and drills. Improved methods of hardening and tempering this kind of steel have also been devised.

The use of ferroalloys in the foundry is likewise extending. The simple method first described in the speaker's address, given before the metallurgical section of the institute a year ago, for softening iron for castings to any desired degree has been continued, with exceedingly beneficial results, in his daily practice.

The speed of turning pulleys has been largely increased and the time required to complete the machine work upon them has been reduced, and in other light castings as well. In addition to the material improvement in the strength of the metal by this treatment there is a decided decrease in shrinkage, so that some castings of irregular shape which are difficult to make without cracking in cooling, owing to unequal strains, are now made without this tendency by this process. Other advantages accruing from the addition of a very small amount of high grade ferrosilicon (containing about 50 per cent. of silicon) have been observed. Among these may be mentioned the cleaning action upon the molten metal which the alloy effects by its deoxidizing influence. Singularly also it is found that commercially pure silicon does not produce these results, neither does the ordinary grade of ferrosilicon, containing about 20 per cent. of silicon.

In the case of pure silicon the specific gravity of the material is too low and its melting point too high to permit it to become incorporated with the molten iron in the ladle; in the other case the proportion of silicon is too low to permit a sufficient amount to be dissolved in the iron to produce a radical change in its quality without causing dull iron in the ladle.

There is, said the speaker, no doubt that when the merits, simplicity, certainty of action and other advantages of this process of treating molten iron in the ladle are better known and appreciated it will come into very extensive use, for it enables the founder to modify the character of his iron to suit individual castings, a matter of considerable importance and value. This is accomplished without expense, for the cost of adding silicon to the iron in this manner is actually less than by the usual method of adding an equal amount of silicon to iron in the form of pig iron comparatively high in silicon added in the cupola. For example, pig iron containing 6 per cent. of silicon costs at the present time, let us say, $20 per ton, and we may estimate for comparative purposes $3.33 per unit of silicon; ferrosilicon containing 50 per cent. silicon costs at the present time in powdered form $100 per ton, or $2 per unit of silicon on the same basis of calculation.

Furthermore, there is no loss of silicon when added in the ladle as there is when melted in the cupola, and this partly accounts for the fact that a given quantity of silicon, when added in the ladle, is much more effective as a softener than the same quantity charged into the cupola. Silicon added in the cupola always weakens the iron, but added in the ladle always strengthens it.

The Eberhardt Bros. Automatic Pinion Cutting Machine.

A machine constructed particularly to cut steel pinions of coarse pitches at as fast a rate of feed as the cutters will stand is a new product of the Eberhardt Brothers Machine Company, Newark, N. J. It is, therefore, particularly adapted for manufacturing purposes where quantities of similar gears are to be cut, but it is also useful for jobbing, since the machine is capable of cutting gears up to 30 in. in diameter, of coarse pitch, in iron, bronze and steel. Front and rear views of the machine are given in Figs. 1 and 2.

This is defined as a pinion cutting machine, for the reason that the standard types of machines now on the market capable of cutting 2 or 3 diametral pitch in steel at a rapid rate have also a diameter capacity of about 60 to 72 in., while the machines which swing only 20 to 30 in. diameter have only a pitch capacity of about 4 to 5 diametrical pitch. Thus the purchaser who requires a machine to cut coarse pitch steel pinions, ranging from, say, 6 to 20 in. in diameter, and wishing to push the work to the limit of the cutters and machine finds that he must pay for a much greater diameter capacity than he needs, merely to obtain a machine powerful enough to do the heavy work. The machine illustrated has a pitch capacity equal to the company's standard 60-in. machine and the same powerful drives and spindles, but the columns are short, being only as high as necessary for pinions. The work being of special nature, some parts required only when cutting large gear wheels could be omitted and some simple adjustments were also possible, as, for example, in the arrangement of the depth adjusting hand wheel, &c.

These pinion cutting machines are especially useful for such work as the cutting of street car motor pinions and gears, this being, in particular, work where very large quantities of duplicate gears are cut at as fast a feed as is possible for high speed cutters to stand. The machine is shown cutting such a pinion, using a roughing cutter and a finishing cutter side by side.

The main features in the construction of the machine are the exceptionally long cutter slide, with the cutter spindle placed in the center, and the means of taking the thrust of the feed screw, which is placed so that the screw draws the cutter into the work and does not push it. This draw cut principle is used throughout the company's designs, and the work done on the machines seems to prove the value of the construction. With these new features the absence of all chattering, even when taking the heaviest cuts, is noticeable.

The cutter is a special tool steel forging of large diameter. As can be seen by the rear view of the machine, the spindle is driven by a very large spur gear. This drive was adopted because of the smooth running and the exceptional efficiency. The changes of cutter speed are made by means of the gears, as close to the last driver as possible. This method of gearing-up late in the train permits the driving shafts to run always at a high constant speed, thus subjecting them to less torsion than otherwise. The cutter speeds and feeds are independent, so that one may be changed without affecting the other.

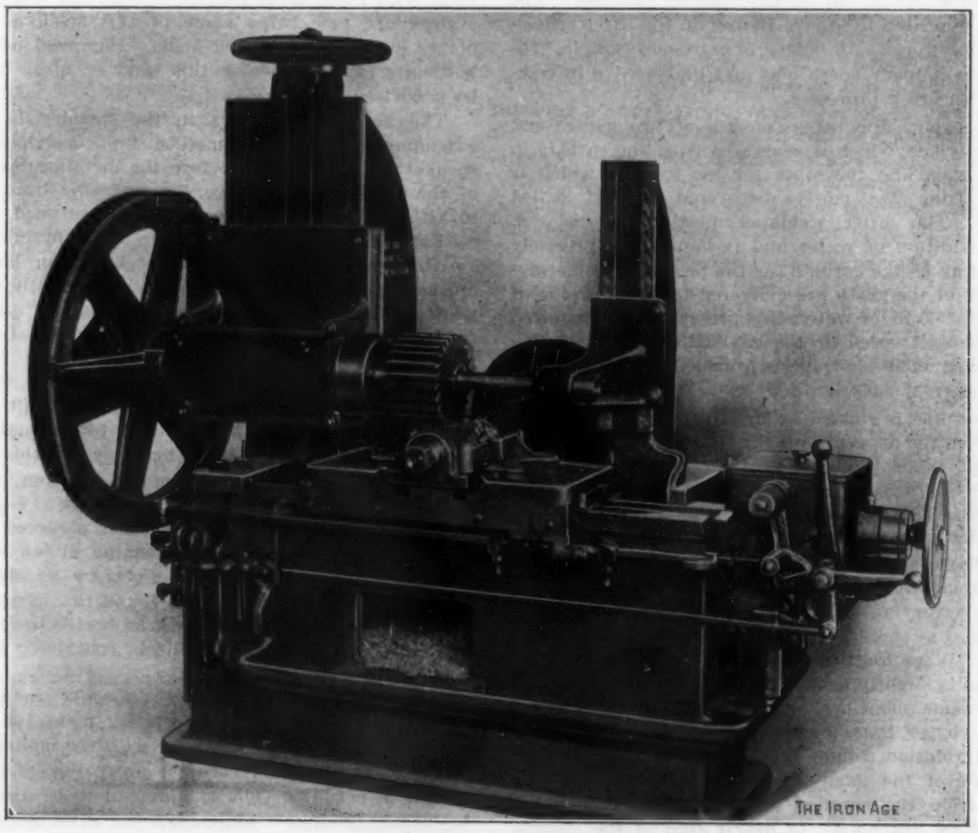


Fig. 1.—Working Side of the New Pinion Cutting Machine Built by the Eberhardt Brothers Machine Company, Newark, N. J.

The indexing and feed mechanisms are so constructed that the engagement of one precludes the simultaneous engagement of the other. Thus, while the machine is indexing it is impossible for it to feed; and while the machine is feeding the indexing lever cannot be operated. These movements are automatically interlocked, and operate whether the machine is running or is being adjusted by the operator.

The indexing wheel is of very large diameter, as can be seen, and is generated theoretically correct. A graduated dial is provided, reading to thousandths of an inch, to facilitate the accurate setting of the depth to be cut. The work arbors are drawn in and forced out positively by means of a bolt at the rear of the head.

The general appearance of the machine indicates its heavy construction. All the bearings, the work spindle, the column, &c., have been designed to meet the latest requirements of heavy duty. The frame of the machine is constructed to form an ample reservoir for the cutting lubricant. A special guard close up to the cutter causes the chips to fall directly into the base of the machine, from which they are removed either at the side or the

front. Suitable strainers are provided for separating the chips from the lubricant.

New Projects for Ontario.

TORONTO, October 27, 1906.—A plant for the manufacture of steel castings is to be added to the establishment of the Polson Iron Works Company in Toronto. It will be of a capacity to employ 100 hands at the outset, the present intention being to enlarge it subsequently so as to require 250 hands. The company appears to have experienced some disadvantage because of its dependence on external sources of steel casting supply. Application has been made to the City Council for the purchase of the slip and land lying west of the company's existing works on the Esplanade. The company is now very busy. It has just obtained the contract to build a vessel 250 feet long for the St. Lawrence route.

The Lake Superior Corporation's ore dock at Sault Ste. Marie is to be extended 500 feet. A new blast furnace is needed to keep the company's steel works supplied with material. The directors have the matter under consideration. Their rail orders call for a greater continuous output than is possible with the existing production of pig iron, for not only is the output of the corporation's furnaces inadequate, but other sources of pig iron do not satisfactorily respond to the demand. There is practically no Canadian pig iron suitable for the company's uses on the market.

The steel rolling mills whose location in Peterborough seemed almost assured will not, after all, be built there. Niagara Falls appears to have offered inducements that captured the enterprise. The promotors say that 100 hands will be employed from the first, and that the number will be increased rapidly with the growth of the works is now projected. A free site and cheap power are the Niagara Falls attractions that overcame Peterborough's advantages. This will be the second important steel plant to be established on the Niagara peninsula, that at the growing town of Welland being now well under way.

Flour mill machinery, saw mill machinery, heavy farm machinery and other outfit will be manufactured at Port Arthur if an agreement entered into by the municipal corporation of that town and the Meisel Mfg. Company is carried out. The works are to be ready for operation by next May, when they are to afford employment for 150 hands. They are to cost from $100,000 to $150,000. The town is to sell to the company a 10-acre site in the district known as the Strathcona addition, the price being $200 an acre. The company has also the privilege of purchasing within five years an adjoining 20-acre plot for extension purposes, the price of this to be $150 per acre. A water lot is to be leased to the company as a site for docks. The town guarantees a first preference bond issue of the company in the sum of $75,000, payable in 10 years, interest at 6 per cent. It is undertaken by the town that the railroad shall be extended to the works and a daily service shall be supplied. Also the town agrees to limit the assessment to $50,000. Port Arthur is rather distinguished among the towns of Ontario for its venturesome public ownership propensity.

The contract for the construction of the Canadian Iron & Foundry Company's new plant at Fort William has been given to the Canadian White Company of Montreal. Railroad car wheels and castings, and cast iron water and gas pipe are to be made in the new foundry, which is to be in operation by next June with 200 hands at work.

C. A. C. J.

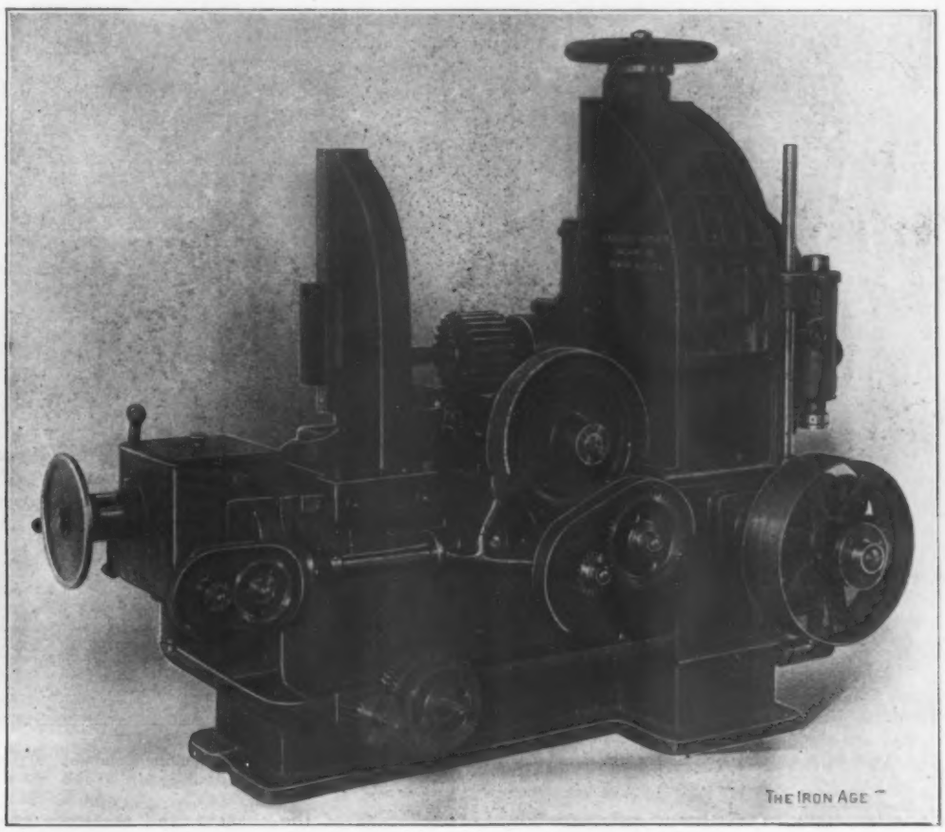


Fig. 2.—A Rear View of the Eberhardt Brothers Automatic Pinion Cutter with Gear Covers Removed.

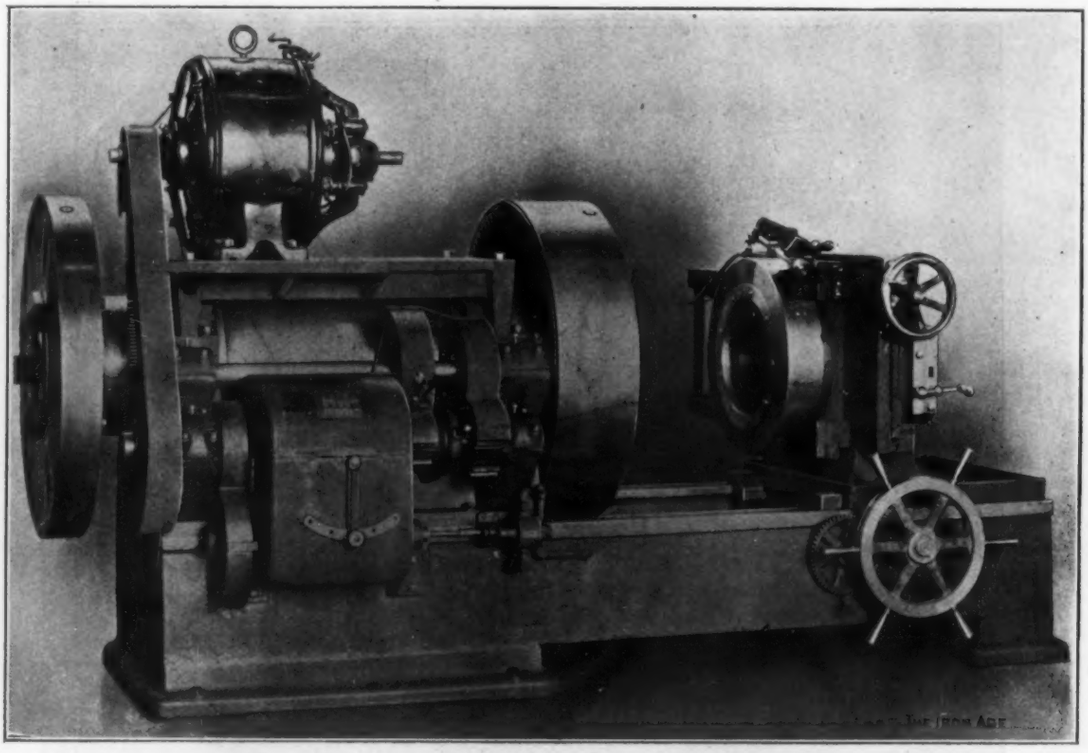
George S. Rice, the engineer of the New York Subway, makes the statement that between the Brooklyn Bridge and Ninety-sixth street stations the brakes are applied about one-quarter of the total time consumed in the run of the local trains, and one-eighth of the total time of the express train runs. More than 20 tons of brake shoes are actually ground to dust in a month on the whole road.

The Portsmouth Harbison-Walker Company announces that all business formerly transacted by this company will hereafter be handled by the Harbison-Walker Refractories Company, Pittsburgh.

A Motor Driven Stoever Pipe Machine.

The machine illustrated is the latest type of pipe cutting and threading machine built by the Stoever Foundry & Mfg. Company, Myerstown, Pa. It is designated as the No. 12 size and cuts and threads pipe from 4 in. to 12 in. inclusive.

The motor driven and belt driven machines are practically identical, as the latter is equipped with a single belt pulley, all speeds being obtained in the gearing. To arrange the machine for motor drive a sprocket wheel for the chain is substituted for the belt pulley and a table for the motor placed above the main bearings, as shown, and the addition of the motor and chain completes the equipment. This arrangement renders it easy to change from belt to motor drive at any time, and the motor driven machine using a constant speed motor has all the advantages of the various speeds obtainable in the belt driven machine without the extra expense and other objections which often apply to the use of resistance boxes and controllers. A constant speed motor has a lower first cost and usually a somewhat higher operating efficiency. If desired, however, a variable speed motor can be used and an additional range of speeds secured.



A 12-In. Motor Driven Pipe Cutting and Threading Machine, Built by the Stoever Foundry & Machine Company, Myerstown, Pa.

The machine is of substantial construction throughout. A departure from former practice is the making of the headstock in one casting, following the usual lathe construction. The gearing is all on the outside of the machine and readily accessible. An innovation in pipe threading machinery is the use of the internal gear drive, which is exceedingly powerful, very compact and of course very safe, as the teeth are protected.

The machine has 10 speeds, the shifting gear in the gear box giving five speeds and the right and left clutch in connection with gears on the intermediate shaft gives two speeds for each one in the box. These speeds can all be quickly obtained, and the change is more easily made than when shifting a belt on a cone pulley and making the additional gear change required in older machines. The gear box is oil tight, and an arrangement is made for holding oil in the bottom, which keeps all gears and shafts constantly lubricated. Owing to the peculiar construction of this box the weight of the shifting gear and sliding mechanism is carried on the brackets and not on the lower shaft, so that there is no tendency for cutting or binding to occur in the box.

The chucks are of unusually strong construction. The main body of the chuck is a single casting. There are no joints or face plates to weaken the construction.

The oil for lubricating the dies is furnished by a rotary geared pump driven direct from a constant speed shaft extending from the gear box. As there is no chance for slip a positive supply of oil is delivered at all times. The amount actually used on the dies and cutting-off tool is regulated by valves at proper points, and a relief valve allows any excess to return to the reservoir.

The die head has been improved by substituting interchangeable hardened steel cams for those of cast iron commonly used. This insures a greater life and accuracy for the head, and if for any reason it should become necessary to replace a cam it can be very easily and cheaply done. In addition to these hardened cams hardened steel plates are placed in the bottoms of the die slots. These afford a permanent bearing for the back edge of the chasers and therefore keep the lead correct, which is very important.

A sliding head has been adopted for the regular design, as it offers many advantages over the older type of stationary head. One advantage is that when, as is often the case, it is more convenient to place pipe in the machine through the die head the head can be pushed out of the way and the pipe pushed through the opening in the stand without injuring the dies. The greatest benefit, however, lies in the fact that the head is movable—floating to some extent. In all pipe there is a certain amount of eccentricity, this being materially greater in the larger sizes; consequently a strain is brought on the dies when used in a rigid head. In this machine the head, being movable, will adjust itself to the eccentricity of the pipe as it revolves. This not only relieves the head of unnecessary strain, but insures a more equal depth of thread around the circumference of the pipe.

The slides for steadying the pipe while it is being cut off and which are placed on the back of the stand are unusually heavy. They are made so to serve in a measure as an anvil and withstand the shock of hammering on a large pipe to correct it if it is too much out of round to show a perfect thread. The cutting-off tool and the reaming tool are held on one of these slides. The carriage is geared so that only a small amount of power is necessary to bring it up to the pipe. The bed is spe-

cially constructed for unusual stiffness between the headstock and the opposite end. The oil reservoir is in the bed, and a smaller supply than is ordinarily used is sufficient for necessary lubrication.

It has been the endeavor to design a machine which will be simple in the arrangement of its parts, thoroughly accessible and easily and cheaply repaired in case of accident. It has also been given great strength to withstand the severe service which a machine of this size and kind is required to give if worked to the limit of its capacity. The machine weighs complete with equipment about 10,000 lb.

Mexican Railroad and Industrial Notes.

Railroad Concessions and Construction.

DURANGO, October 24, 1906.—The National lines of Mexico, which some time since purchased the Hidalgo & Northeastern, have sent engineers into the field to locate the projected extension of the latter to the gulf port of Tuxpam. It is reported by the press of the capital that the International Railway Company, a part of the National system, will be extended from its present terminus in Durango to a connection with the Mexican Central at Gutierrez, and from that point to the city of Guadalajara, and that the surveys are now being made.

A company has been incorporated in Oklahoma with the title of the Orizaba Railway Company of Mexico City, Orizaba and Guthrie, whose object is to construct a line 20 miles in length between Orizaba and La Perla, both places being within the State limits of Vera Cruz. The incorporators are G. W. Patterson, N. W. Penticost, L. E. Penticost, N. G. McGinley and C. B. McKennon.

A concession has been given to Richard Crombe to construct a line between the town of Tepehuanes in the State of Durango, and Ouilacan, the capital of Sinaloa. Ten years are allowed for the work. The line is to be either narrow or standard gauge and the surveys must be begun within six months.

The concession granted to the Ferrocarril Carbonifero de Coahuila Company for the extension of the Mota del Cura & Barroteran Railway to the coal lands at Nogalitos has been canceled and the deposit of $3750 forfeited, in consequence of the failure of the concessionaires to fulfill their obligations.

Andres Bermejillo & Co., bankers, of the City of Mexico, and Señor José M. Zaldivar have obtained a concession to construct a railroad from Salvatierra to Yuririapundro, and from that place to Moroleon in the State of Guanajuato, or to Puruandiro in the State of Michoacan. Five years are allowed for the work, and a deposit of $15,000 has been made by the company as a guarantee.

Industrial Notes.

J. Cristin, formerly at the head of a German bank in Mexico, is promoting the development of a large iron ore property situated in the State of Vera Cruz. He is engaged in an effort to organize a company with European capital with a view to open up the mines and establish an iron and steel plant in the vicinity of Tampico. The iron ore bodies are near Jalapa and are reported to be of considerable extent and of good quality, both hematite and limonite having been found.

In the hope of obtaining a cheaper fuel than imported coal for the operation of the road the Kansas City, Mexico & Orient Railway Company has joined the various other petroleum oil prospecting concerns in Mexico and is now engaged in sinking wells in the territory adjacent to its line.

The Mexican Central is extending the adoption of oil instead of coal upon its various divisions, the locomotives being equipped with oil burners in its own shops as they can be spared from service.

A brisk demand exists for structural steel, many new buildings of modern type now being erected in the capital and other cities. The demand for steel rails is also active.

The principal railroad systems all report an increase in the volume of both passenger and freight traffic. Among the orders lately placed for rolling stock was one by the Sierra Madre Railway Company for 500 flat cars and for a number of box, stock, and water cars. Several new locomotives will also be ordered by this line shortly. The Mexican Car & Foundry Company has been given an order by the Mexican Southern Railway Company for three first-class passenger coaches and two baggage cars.

Application has been made to the Government by Alexander Ainslie of the City of Mexico for a concession to establish a factory for the manufacture of horseshoes and horseshoe nails.

F. T. Berger, who represents English manufacturers of an extensive line of mechanical apparatus and appliances, including agricultural implements, cotton and sugar mill machinery, electrical supplies, &c., has opened an office at 10 Calle Alfaro in the capital.

F. H. Hardus has been made representative in Mexico of a number of the principal manufacturers of firearms and ammunition.

The Torreon Iron Works, S. A., of Torreon, intends to make important additions to the plant, in which the sum of $50,000 will be expended. The State Government has granted the company operating the works exemption from taxation for eight years upon the investment.

Mexico continues to be a good customer of United States locomotive manufacturers. During the first seven months of the present year 30 locomotives were imported, against 27 in the same time in 1905, and 128 in the corresponding period in 1904.

A new electric company has been formed in Chihuahua with the title of the Compañia Agricola y de Fuerza Electrica del Rio Conchos. The company intends to erect a power plant near the falls upon the river and to distribute electric power for industrial purposes and also to build a dam and to supply water for irrigation. Paul Ginther of Santa Rosalia, Chihuahua, is a promoter of the undertaking.

A water power concession has been granted to the Schoendube & Neugebauer Company to utilize 10,000 liters of water per second from the Conchos River in the State of Chihuahua for the generation of electrical power. Construction must be commenced within 20 months and the plant completed within seven years. A deposit of $5,000 in bonds has been made by the concessionaires. Similar rights have been granted to Frumencio Fuentes for the use of the waters of the Nazas River in Durango and Coahuila for irrigating purposes, and to Andres Brandenburg, by the State of Oxaca, for the use of waters from the Ojo de Agua for the generation of electricity to light the towns of Tehuantepec and Juchitan.

J. J. D.

High pressure gas distribution by the Western United Gas & Electric Company supplies 24 cities and towns west of Chicago, the population served being about 140,000, and the line 52 miles in length. The most interesting feature of the system is the concentration of all the gas manufacturing at Joliet, making all the other consumers in the district dependent upon the pressure lines. With an initial pressure of 50 lb. per square inch at Joliet, the drop in the 8-in. main to Copenhagen, 16½ miles, is 10 lb. From this point a 6-in. main runs to Aurora, 7½ miles, with a further drop of 10 lb. From this point a line to Elgin consists of 5 and 4 in. pipes, the distance being 23 miles, and the resultant pressure barely enough for the distribution. It is proposed to introduce pumping machinery at Elgin, in order that the system may be still further extended, without the necessity for raising the initial pressure above 50 lb.

Clinton E. Hobbs, who for the past 24 years has been connected with Dodge, Haley & Co. and the A. M. Wood Company, Boston, Mass., representing both houses as traveling salesmen, will open an office Nov. 5 at 143 Federal street, Boston, as manufacturers' agent for iron, steel and manufactured products. He will have ample warehouse facilities at Everett Station, Boston. Mr. Hobbs is Past Supreme Counsellor of the Order of United Commercial Travelers of America.

The New Plant of the Boston Gear Works.

At Norfolk Downs, a suburb of Quincy, Mass., six miles from Boston, on the Plymouth Division of the New York, New Haven & Hartford Railroad, the Boston Gear Works has erected a modern shop. The arrangement and equipment of the various departments have an especial interest from the fact that the work done consists almost solely of gear cutting, this being a business that the proprietor, Frank Burgess, has been engaged in for the last 25 years. The most improved methods of handling the rapidly increasing business and the comfort of the workmen employed were two main considerations in designing the building.

The main building is approximately square, being about 100 ft. wide by 125 ft. long, with a second story over the middle portion, and is so constructed that it may be extended in three directions. The large number of windows, and the skylights, facing the northeast in the saw tooth roof, extending completely across the shop, provide an abundance of good light, the full advantage of which is realized by the white paint of the interior. The sides are covered with galvanized iron clapboards and every effort has been made to render the building completely fireproof both inside and out.

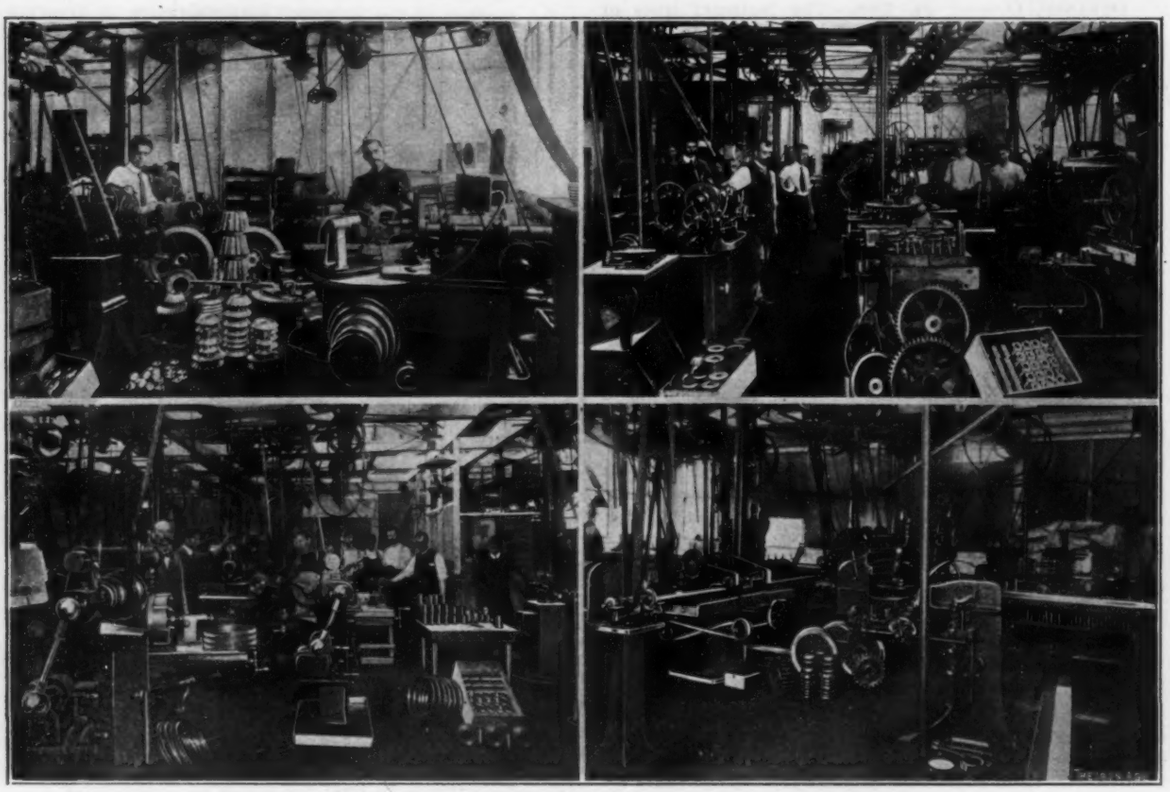
The main door enters into a large hall where there is located a telephone switchboard communicating with the different departments and the main outside telephone exchange through three trunk lines. At one side of the hall is the office of the general manager and on the other a general office. Upstairs there are two rooms, one for the draftsmen and one for the treasurer, the bookkeeper and assistants.

The main floor of the shop on the first floor is entered by a door at the end of the hall. The heavy machinery grouped on this floor is driven by two Hornsby Akroyd crude oil engines of 25 hp. each, located in the basement, where provision is made for carrying a month's supply of fuel. The engines are run simultaneously, but may be run separately in case of accident to any part. A system of piping and a triplex pump delivers the hot water from the cylinder jackets of the engine to all parts of the building for use in the different lavatories. A steam heating plant maintains a temperature of 65 deg. on even the severest days of winter throughout the shop. Artificial light is furnished by electric lights wired so that any section of the shop may be lighted independently.

The management of the shop is in the hands of an expert who controls the different departments through experienced trained men known as the jobbers. These men issue the orders for work to the shop directly, each handling those for which he is best fitted by experience and training. The machines are grouped into departments in charge of experienced foremen who bear the same relation to the superintendent that the jobbers do to the central head, before mentioned, and are able to follow personally the different jobs entrusted to them. The shop is divided into the following departments:

Turning Department	Turret lathes. Engine lathes. Boring mills. Automatic screw machines.
Cutting Department	Bevel gear planing. Spiral gear cutting. Milling, spurs, bevels, miters and racks. Spur gear planing. Worm gear cutting.
Brass Model Department	Experimental work. Clockwork.
Stock Gear Department	A stock of all standard gears.
Tool Department	Special tools and gauges. Jigs. Special cutters. Dies. Cutting tools.
Pattern Department	Shop. Storage.
Automobile Department	Steering devices. The Boston ball joint. Chains. Sprockets.

The bevel gear planing section is equipped with special machinery for the generating of perfect tooth curves on correct cone lines. The planing process for coarse bevel gears is fast taking the place of the milling process, inasmuch as planed gears can be designed with larger



Bevel Gear Planing.
Helical Spur and Spiral Gear Cutting.

Worm and Worm Gear Cutting.
Spur Gear and Rack Planing.

Views in the Boston Gear Works' New Plant.

faces and run at high speed, with greater durability and less noise than milled gears. Bevel or miter gears, which are to be used for patterns, are found to be much superior with planed teeth, especially when planed to the 20-degree angle of pressure, which eliminates under cut. In the spiral section are machines for handling all descriptions of spiral work, including the latest for cutting worms and screw threads. Work has been executed to a limit of 0.002 in. on the depth of cut, and 0.001 in. on thickness, pitch exact. The milling section is provided with a wide range of milling cutters of all pitches, both epicycloidal and involute, for spur, bevel and miter gears and racks to be cut by this process. The spur gear planing machines are of the latest type, and produce the most perfect spur and internal gears and racks possible. The tooth curves are generated by special cutters, and the spacing is absolutely accurate. This work is especially adapted for automobiles and high grade machinery. The worm gear section has at its disposal a large stock of hobs and machines of any capacity.

The tool department is in charge of an expert, who is employed the greater part of the time on special tools required in the manufacture of patent ball joints and special gearing. In the stock department upward of 5000 sizes and styles of gears are kept, and the stockroom is divided into sections, corresponding with the divisions of the company's catalogue, so that it is as easy to find a particular gear as it is to find its page and number in the catalogue.

Work in the automobile section includes the manufacture of a complete steering device of the worm and worm gear sector type for automobiles. The Boston ball joint, a joint having a solid ball large bearing surface, is also manufactured here. This department also handles orders for chain, all makes of which are carried in stock, and the cutting of sprockets for them, a large assortment of which is also kept in stock.

The arrangements of all sections is such that the job makes as short a circuit as possible, passing as directly as convenient from entry to the foundry receiving room to the turning section, thence to the cutting section, and finally to the testing section, where it is inspected and frequently run under power before being delivered to the shipping department.

The cost system has been organized, with a view to giving in detail the cost of any job passing through the shop. Accurate records kept on blanks provided for the purpose and checked by the foreman are turned in each day, showing the exact time used on every job throughout the day and the material used is accounted for by the jobber in a space provided on the card.

The time keeping is largely automatic, a time clock being used on which the hundred odd men employed record the time of their coming and going. In the basement there is a large washroom with individual lockers, each having its own key. The water system already mentioned gives a continuous supply of hot water. A good sized hardening plant is in course of construction.

The company will still maintain a Boston office at 102 High street, in that city, where mail, samples and small shipments will be handled.

Hot water and electrical heating of cars have been compared by the Chicago City Railway Company. Weight of heaters: Hot water, 1454 lb.; electric, 360 lb. Price of heaters per car: Hot water, $140; electric, $80. Repairs per day: Hot water, 10 cents per car; electric, 5 cents. Attendance on hot water heaters, 10 cents per car per day. The electric heaters use 12 amperes at 500 volts for 9 hr., a total of 54 kw.-hr. per car per day. This is figured at a cost of 0.992 cent per unit of power. Figuring up the total maintenance and fixed charges cost, the hot water system was found to be 80 cents per car per day, and the electric 73 cents.

A large field of service in office buildings awaits the suction gas producer and the close regulation gas engine when they have been brought to a better state of reliability, according to *Power*. It is suggested that so far as heating is concerned the exhaust gases and jacket discharge of a gas engine provide a fairly plentiful source of heat and one more economical than the exhaust from a steam engine of equal output. Tests recently made at Kilmarnock, Scotland, in the raising of steam in boilers heated by gas engine exhaust showed an evaporation of 2½ lb. of water into steam at 40-lb gauge pressure for each brake horse-power developed by the gas engine.

Central American Notes.

LA LIBERTAD, C. A., October 6, 1906.—The recent earthquakes all along the coast of the Pacific have laid in ruins not only the important city and port of Valparaiso, Chile, but also Los Andes, Arica, Caldera and upward of a dozen others. In the reconstruction of the wharves, quays and breakwaters of Valparaiso steel will be used mostly, as also in the frames of the Government buildings, custom house and not a few private residences. The material destruction has been much greater than at San Francisco, but Chile's Government and people are wealthy and entirely determined to build up their cities in the most modern and substantial manner. Many of the stations and much of the roadbed and material of the Transandine Railroad between Chile and Argentina will have to be renewed. The rails in many portions of the line have been twisted into all kinds of fantastic shapes. In imitation of several of the cities of Salvador and Nicaragua it is most probable that many private dwellings will be rebuilt with steel frames.

To show the interest that the German Government has in Southern Brazil (Rio Grande) it is stated that special exemptions from military service have been made to those Germans who go to Rio Grande do Sul and the nearby German colonies. The imports of German iron, steel and hardware are calculated to be over $20,000,000 yearly. Italy is not behind in offering business advantages to those colonizing the interior of the Argentine Republic. In Buenos Aires, Rosario, Cordoba, Tucumen and other towns many of the stores, hardware shops, repair shops, &c., are in Italian hands. A large percentage of laborers on the Transandine Railroad are Italians. Four bridges built in America will be put in place next month on this line.

The peaceful influence of the United States was quickly shown in the ending of the war between Salvador, Guatemala and Honduras. Little damage had been done, and now work will be resumed on the Central de Guatemala line, which is in the hands of an American syndicate, and also on the Salvador Railroad, which is British. Honduras will also be able to continue the extension of its Pernienta Railroad toward the capital. A branch will probably be surveyed toward the southwest, where the new gold and silver mines are attracting attention.

Paraguay deserves some attention from our business men. Two new lines of steamers have been put on from Montevideo and Buenos Aires to bring down the crops of mate or Paraguay tea, sugar, tobacco and indigo, and to supply the country, especially Asuncion, with general hardware, building material, flour, &c. The Government has granted a concession to build a railroad from the capital to tap the Matto Grosso line through Brazil to the Atlantic.

All along the Pacific towns and ports American goods, especially hardware, are more than holding their own. The people are gradually learning to distinguish our goods from Belgian and other imitations. There never will be a better time than the present to agitate the adoption of a trademark law between the United States and all the Spanish-American republics. These countries are flooded with counterfeits from Europe purporting to be American rifles, revolvers, plows, axes, bicycles and machines of all kinds. A treaty on trademarks between the United States and these countries will mean millions in the pockets of our manufacturers. C.

Leading citizens of Trenton, N. J., will erect in a local park a monument to John A. Roebling, the famous builder of suspension bridges and the founder of the John A. Roebling's Sons Company.

An Improved Quint Turret Drill.

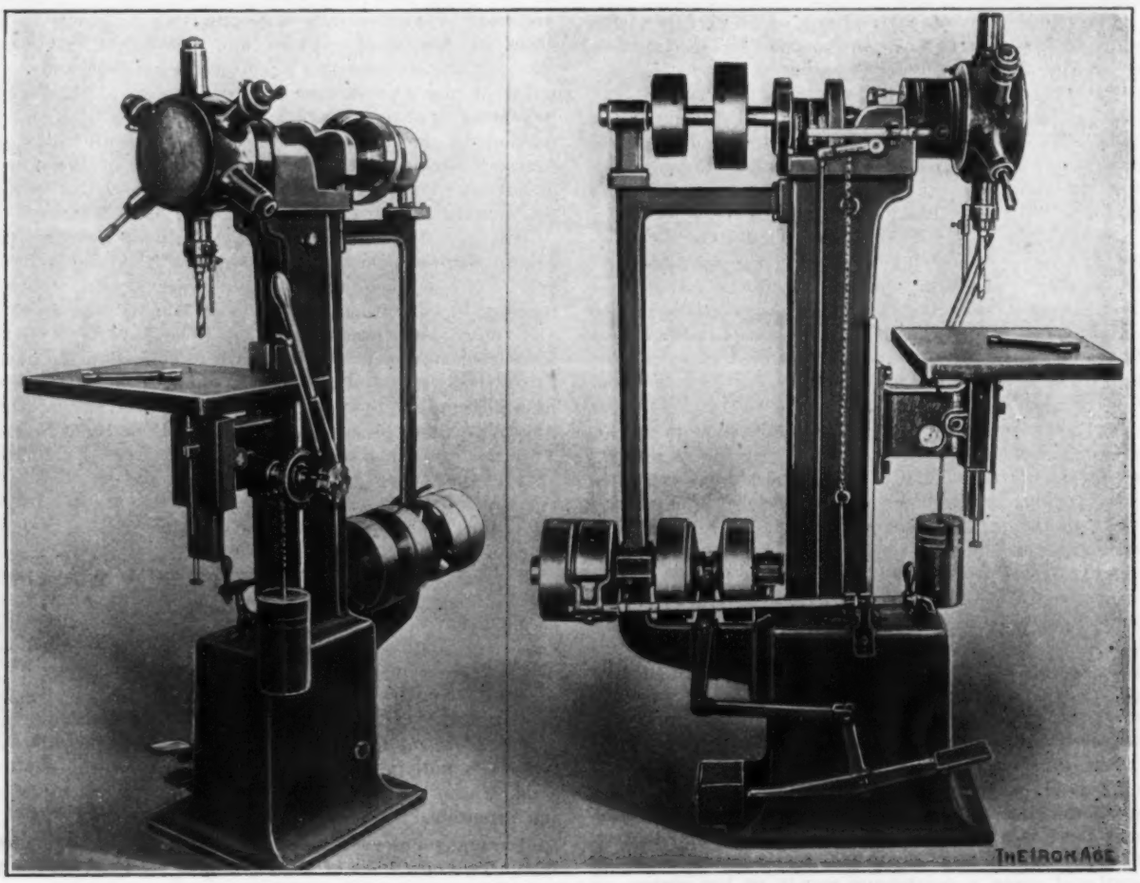
The machine illustrated, built by A. D. Quint, Hartford, Conn., an improved No. 2 turret drill, is designed for the manufacture of duplicate parts, and holds a similar relation to a drill press that a turret lathe does to a common lathe. Its turret spindles permit of a very wide range of operation on a piece of work, including tapping and threading, without the use of special mechanisms. One important improvement contained in the new model is a ratchet feed with counterbalance that will balance any weight on the table, and replaces a combined hand lever and treadle feed. Weights may be added to or removed from the counterbalance according to the weight of the work on the table, so that all the power exerted by the ratchet lever is expended in feeding the work to the tool.

The reversing lever for use in tapping and thread cutting is an important feature of the machine. On the pulley shaft is a clutch, operated from a treadle through a system of levers. When tapping the tap is backed out by pressing with the foot on this treadle, which causes the clutch to engage with a pulley carrying a cross belt leading to the driving shaft; and when the foot is removed a weight on the treadle causes the clutch to engage the direct drive pulley, the spindle rotating for the next operation.

Power is transmitted to the driving spindle in the turret by steel miter gears. The turret revolves about a central part which contains the driving spindle. The latter has at its lower end a positive clutch which engages the upper end of the turret spindle, then in the central position, so that this is the only spindle rotating. This clutch is also manipulated by a foot treadle, leaving the hands of the operator free to handle the work, and a pressure on it raises the driving spindle out of engagement with the turret spindle, at the same time removing a stop which locks the turret in place. The operator turns the turret to bring any desired spindle in the central position and the releasing of the treadle causes the driving spindle to drop, engaging the turret spindle and simultaneously locking the turret.

Any spindle may be turned to central position without stopping the machine, making possible the rapid handling of work such as the tool is particularly designed for, namely, quickly and accurately drilling shallow holes of widely varying sizes in duplicate parts of light and medium weight. It is possible to drill, tap, ream and counterbore jig work or brass fittings, finishing all operations at one setting, without losing time by changing tools or shifting the work itself. When more power and less speed is required the back gears may be clutched in without stopping the machine, by means of the clutch lever on the side of the head.

The drills are built with 6, 8, 10 or 12 spindles. The greatest distance from the table to the end of a spindle is 20 in.; the distance from the center of a spindle to the face of the column 8¼ in.; the vertical feed movement of the table 7 in., and the area of the table 14 x 20 in.



Two Views of the Improved No. 2 Turret Drill Built by A. D. Quint, Hartford, Conn.

A new record for the world's gold production is expected to be made in 1906. In the first eight months of this year 3,657,357 oz. of fine gold have been raised in the Transvaal alone; and at the same rate for the last four months of the year the output for the whole of 1906 will be 5,486,033 oz. This would compare with 4,897,221 oz. in 1905, 3,779,621 oz. in 1904, 2,963,749 oz. in 1903, 1,704,410 oz. in 1902, and 238,992 oz. in 1901. Alaska, too, is growing in importance as a gold field. Already a half dozen gold dredges are in operation there or being installed and more will be added, with a large resulting increase in production. In 1905 the Klondike output fell off to $7,500,000 from $10,350,000 in 1904. $18,000,000 in 1901 and $22,275,000 in 1900. The entire Alaskan output is expected to be about $20,000,000 in 1906, as against $14,500,000 in 1905 and $9,000,000 in 1904.

Customs Decisions and Regulations.

Automobile Imports.

With the leasing of space in a United States bonded warehouse customs officials at New York believe that they have solved, for the time being at least, the automobile import problem. Practically all the automobiles brought to this country are entered through the New York Custom House, and, as the importations have increased nearly 100 per cent. during the past two years, the available space at the Appraiser's warehouse has become entirely inadequate. The additional room leased on West Twelfth street, adjacent to the Federal Building, is proving a great aid in expediting the examination and appraisement of machines. In this connection the executive officers of the customs desire *The Iron Age* to deny recent articles appearing in the daily newspapers to the effect that autos are detained unduly while under official inspection. On the contrary, the Treasury representatives state that, provided all the requirements of the law have been fulfilled, deliveries to importers are very prompt.

Procedure in Customs Cases.

The Board of United States General Appraisers handed down a decision October 12 dealing with procedure under the customs regulations which is of general application. It appears that the importers figuring in the test case objected to the classification returned by the collector of customs. A protest was accordingly forwarded to the board asking for a review of the collector's action. In the official protest filed with the tribunal the importers failed to mention specifically the paragraph of the tariff law under which classification was desired. On account of this omission the collector advised the board that the protest must be regarded as faulty.

The board, however, disagrees with the collector and sustains the protest. It so happened in the case at bar that there is only one paragraph of the tariff law under which the importers could have made a claim for assessment. In view of this fact the board holds that the official statement made by the protestants must be construed as referring directly to the paragraph, notwithstanding the failure of the firm to mention the paragraph. General Appraiser De Vries, who writes the decision for the customs tribunal, says that if there were other paragraphs equally applicable to the merchandise under protest it would have been incumbent upon the importers to name the paragraph under which they desired classification.

In the past there has been much misunderstanding among importers regarding the necessity of naming in protests specific paragraphs under which duty was sought. In many instances such claims have been overruled owing to the fact that one of several paragraphs might have been applicable by the importer at the time the protest was drawn. The decision just promulgated may do much to correct the misapprehensions of importers on an important subject, thereby saving them annoyance as well as outlays in the shape of duties higher than those actually applicable to the merchandise.

Duty on Fire Brick.

The Board of United States General Appraisers, in a decision by C. P. McClelland, has sustained a claim filed by the Semet Solvay Company against the action of the collector of customs at New York in assessing a high duty on brick intended for retort settings. It appears that the merchandise was classified by the Custom House authorities under the provision in the tariff for earthy or mineral substances, with duty at the rate of 35 per cent. This return was opposed by the importing firm, it being maintained that the settings should be granted entry as "fire brick," with assessment at the rate of $1.25 per ton. In a similar case before the Board of Appraisers last year the tribunal overruled the claim of the importers, but since that time the original case has been passed upon by the United States Circuit Court, which reversed the lower tribunal. General Appraiser McClelland says that if the issue were before the board for the first time the question of the classification of the merchandise would be decided adversely to the importers. As the court has reversed the board, it is necessary for the General Appraisers to sustain the protest in order to follow the ruling of the court.

The Carding Engine Duty.

The Treasury Department has decided to renew the litigation dealing with the customs classification of carding engines. Last year the Government began assessing compound duties on the machines, but when the protest case of the importers came before the Board of United States General Appraisers that tribunal held that the Government's action was illegal. An appeal was taken to the Federal Circuit Court, but later the Treasury administration concluded to abandon the original case and bring a new test on a more complete record. The latest test stands in the name of Evan Arthur Leigh, Boston, who objects to the assessment of 45 per cent. on the carding engines and 45 cents per square foot on the card clothing on the machines. Instead of this double tax the importer insists that the machines are subject only to the ad valorem duty. At the hearing given by a member of the Board of Appraisers in Boston last week several witnesses were examined for the importers and the Government. The domestic makers are understood to have been responsible for the new test case by the Government. The board will formulate a decision some time next month. Later the courts will pass upon the points involved.

The Zinc Ore Hearing.

A final hearing in the zinc ore tariff controversy was held by the Board of United States General Appraisers October 25. The sole witness was Dr. David T. Day, Chief of the Geological Survey. At the close of his testimony regarding the composition of zinc ore notice was given the opposing counsel to submit briefs within two weeks, after which the customs tribunal will take the question of the dutiable classification of the ore under advisement. The testimony taken in this case is voluminous. The Government and the domestic mine owners maintain that the ore shall be considered a metallic mineral substance for the purposes of duty, with assessment at the rate of 20 per cent. On the other hand, the smelters of the United States desire that the product be allowed to enter on the basis of 1½ cents per pound on the zinc actually contained therein.

A Decision on Jurisdiction.

The Board of United States General Appraisers, in a decision announced October 27, held that the customs tribunal has jurisdiction only to review collectors' decisions when merchandise is lawfully and regularly invoiced and appraised. On this account the board dismissed a protest filed by Lloyd Bros. & Co., Cincinnati. It appeared from the testimony in the case that the importers failed to claim the merchandise when it reached the United States, whereupon the customs officials sent the goods to a bonded warehouse under the provisions of the so-called "general order" regulations. After the lapse of a year the merchandise was sold at public auction to the original importers, who, in order to obtain possession of the wares, were obliged to pay a sum far in excess of the entered, or invoice, value of the merchandise.

It was claimed by the importers that they should have been permitted to bid in the goods on the basis of the invoiced prices, and in that way obtain possession. The board holds, however, that under the circumstances it has no jurisdiction and cannot grant the relief desired by the importers.

Copper may be distilled at atmospheric pressure by heating small pieces of the metal in a crucible in an electric furnace, the roof of which is perforated by a hole, covered with a thin glass bell jar, while a copper pipe through which flows cold water traverses the furnace a short distance above the crucible and arc. It has been found that the metal condenses on the tube to a depth of 0.03 in. in the form of copper threads, resembling filamentous silver, the color varying from red to yellow. It contains upwards of 99.7 per cent. of copper, with traces of chalk and graphite, and after removal of the chalk by treatment with acetic acid has a density of 8.16, which is lower than that of fused copper, and points to the possible occlusion of a small quantity of gas.

The New Champion 14-Inch Engine Lathe.

A generally heavier design is the first thing to be noticed in the new standard 14-in. engine lathe built by the Champion Tool Works Company, Cincinnati, Ohio, and illustrated in Fig. 1, herewith. The extensive use of high speed steel tools is the factor that has influenced the manufacturer to increase the proportions of the lathe and give it additional weight and rigidity. Among its mechanical features perhaps the most interesting is the automatic stop for the longitudinal feeding mechanism, shown in Fig. 2.

The automatic stop operates in connection with the longitudinal feed rod D, and may be set to act at any position of the carriage. The feed rod D carries two adjustable collars, one on each side of the carriage, which, when encountered by a pin which is part of the carriage, cause the lateral displacement of the rod. Such a movement in either direction disengages a clutch in the driving gear A on the feed rod in the gear box near the head end of the lathe, and the feed ceases. Normally the feed rod is held with the clutch engaged by two spiral springs, C and C, on the feed rod. In this central position a key extending through the rod has its ends engaged by diametrically opposite notches on the inner circumference of a ring B, which is integral with the gear A. There are three sets of these notches, so that the clutch may be engaged at six different points in a revolution. The gear A is otherwise loose on the feed rod. The clutch ring B is held intact with the gear A by the cap F and the screws as shown. The loose parts, gear A and cap F, are held against lateral movement by fixed parts of the containing case. Gear A is driven from gear E, keyed on the feed screw, and this in turn is gear driven by a train of gears from the spindle. In the box is a nest of three gears, giving three different speeds to the feed screw. One or another of these gears is made active by a plunger and dive key, not shown on the detail. The plunger handle, however, may be seen on the exterior view given in Fig. 1.

The head spindle of the lathe is made from hammered crucible steel and has a 1 9-16-in. hole bored from the solid stock. It is accurately ground and mounted in phosphor bronze boxes. The head and tailstocks are of large proportions, the latter being of the now common form in which clearance is allowed, so that a compound rest can be set at an angle, and it has a graduated base so that it may be set over for taper turning. The spindle centers are adapted for a No. 3 Morse taper, and the head center is bushed. The feeds can be reversed from both the apron and the head, and the arrangement is such that the rod and screw feeds cannot engage at the same time, eliminating the danger of breaking apron parts. Cross and longitudinal feeds are provided, and all of the feeds are gear driven, as has been indicated, with three changes of feed and thread, and an unlimited range of feeds and threads is possible by using additional change gears on the outside, between the spindle and the gear box.

The carriage and tool rest have quick adjusting taper gibs. The tool rest and cross feed are graduated to read in thousandths of an inch. The carriage has T slots and a chasing dial for catching the thread at any point without stopping the lathe or reversing the lead screw. A machine cut steel rack in one section is used on the front of the bed for the carriage, and the rack pinion can be dropped out when changing threads when desired. The lead screw is not splined, as the feeds are obtained through the feed rod. The back gear ratio is 9 3-16 to 1,

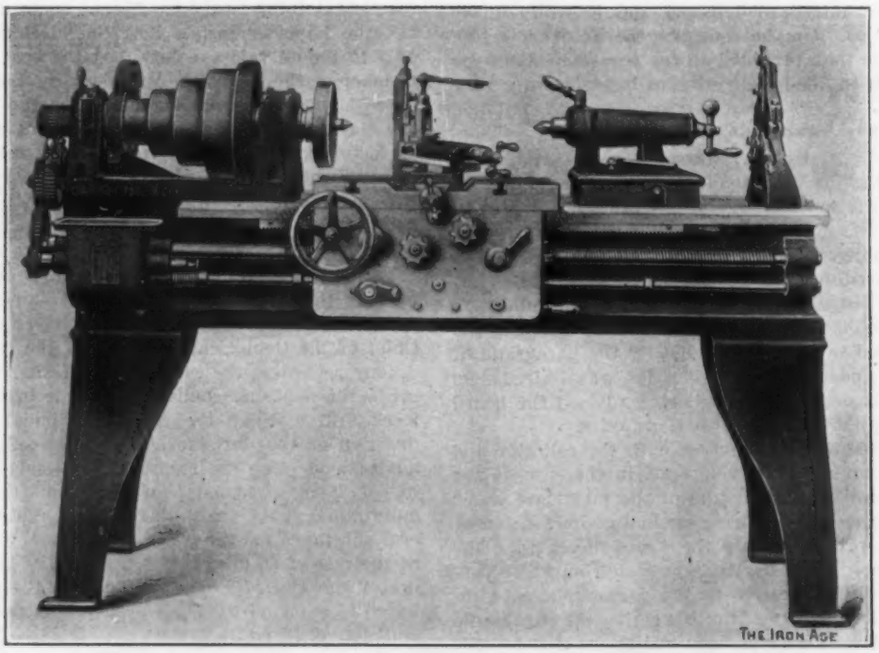


Fig. 1.—The New Standard 14-In. Engine Lathe Built by the Champion Tool Works Company, Cincinnati, Ohio.

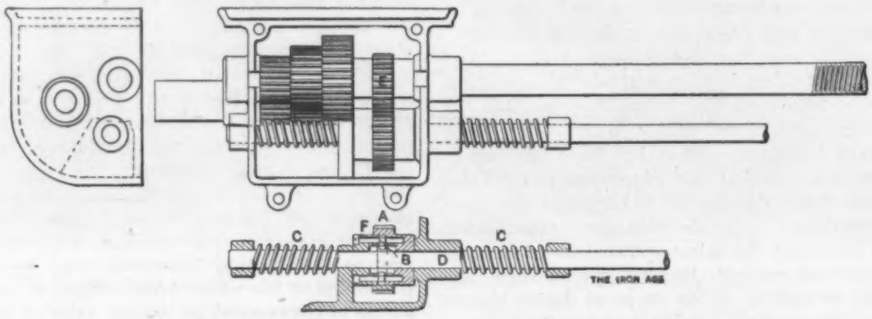


Fig. 2.—Detail of the Automatic Feed Stop Mechanism.

the swing over the bed is 15 in., the swing over the carriage 9½ in., and all screw threads between 2 and 96 per inch, including 11½, may be cut. The lathe is made in bed lengths of 6, 8, 10 and 12 ft. The 6-ft. bed takes 3 ft. 2 in. between centers and weighs 1500 lb.

The Graham Drill Speeder.

To run small drills at a proper speed when they are being used in drill presses intended for larger and consequently, slower running drills, the Graham Mfg. Company, Providence, R. I., has brought out a device called a drill speeder. To run a small drill slowly is wasteful of time, but if the machine is a large one and is speeded up the right amount it makes a frightful noise, causes excessive vibration and racks itself to pieces. The inconsistency of running a 2-in. spindle to drive a ¼-in. drill is obvious. It is often necessary to drill a number of small holes in large pieces, and it is desirable to use a large press to obtain substantial support for the work. With this device the proper speed is obtained without speeding the drill press beyond its intended range.

The device by itself is illustrated in Fig. 1, and Fig. 2 shows it as used on a radial drill. It will be noticed that

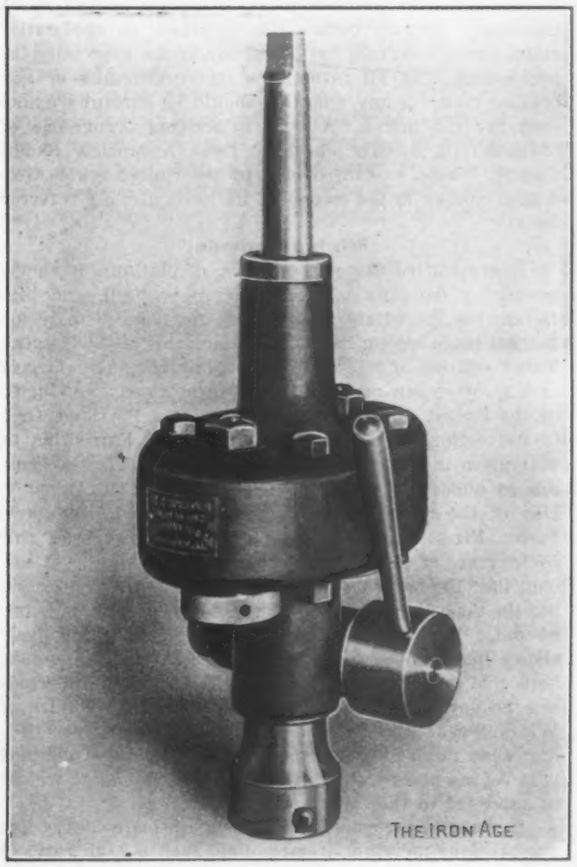


Fig. 1.—A Speed Increasing Drill Attachment Made by the Graham Mfg. Company, Providence, R. I.

the speeder is pushed into the spindle in the same way as is the shank of an ordinary drill. The case is held from revolving by a rod running back to the column or any other stationary part of the machine. On the lower end of the speeder shank is fastened a gear which meshes into two sleeved pinions on either side, and which in turn contain frictions and gears that mesh into a gear on the speeder spindle which holds the chuck. The speed ratio of the spindle of the speeder to that of the drill is 4 to 1.

Particular care has been taken with details, both in the design and construction of the device. The gears, which of necessity require keys, have them left from solid stock and not inserted. Where two pieces of like material have running fits, one or the other has been case hardened.

The most important feature of the device is the sensitive feed lever on the side, without which it would be of little value, since to feed a very small drill with a large, coarse feed mechanism such as is common on a large tool would be absurd, as it would be impossible to know whether the drill was being crowded or the reverse. An-

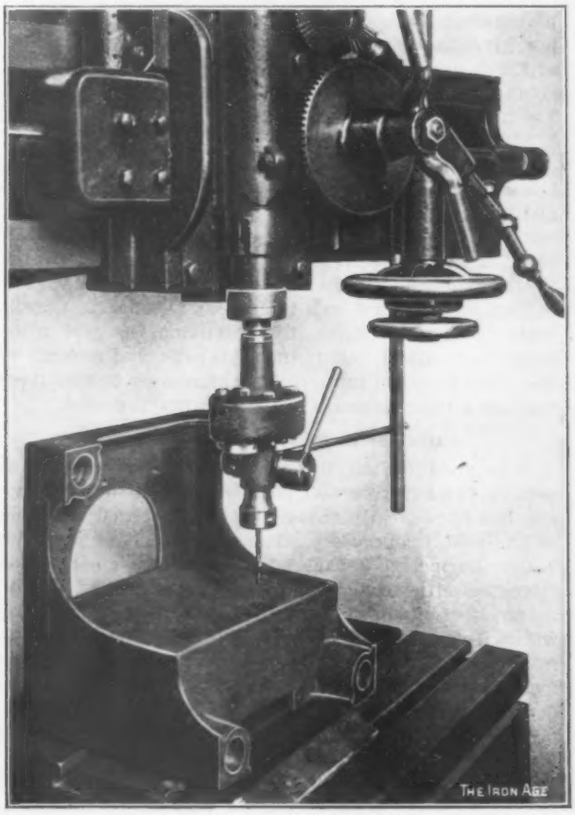


Fig. 2.—The Graham Drill Speeder in Use on a Radial Drill.

other essential is the provision of easily accessible friction nuts for adjusting the frictions of different drills.

The drill speeder is made in two sizes, the No. 1 taking drills up to ¼ in., and the No. 2 taking drills up to ½ in. The shanks are No. 3 Morse taper in both cases. The total length of the speeders exclusive of the tapered shanks is about 9 in. The sensitive hand lever, through a rack mechanism, gives a feeding movement of about 2 in. The weights of the two sizes are 14 and 18 lb., respectively.

The Giornale d'Italia, Rome, Italy, announces that the Midvale Steel Company, Philadelphia, has obtained from the Italian Government an order for 2100 tons of armor plate, valued at $1,000,000, for a man-of-war. The American company was in competition for the contract with five European firms, including the Krupps. Its tender was $180,000 less than that of the Italian Terni factory. It is stated that the successful Italian bid of the Midvale Company is about $131 in excess of its bid of $345 a ton for class A armor, under which it obtained half the contract for supplying the armor for the new United States battleships South Carolina and Michigan.

The New York State Steel Company, Buffalo, N. Y., has decided to begin soon upon the construction of a 500-ton blast furnace, with the expectation of putting it in operation early in 1908. Contracts have not yet been let and it will be a few weeks before the plans will be ready for such lettings. It is the expectation that the two 200-ton Talbot open hearth furnaces of the company will start up early in 1907. Some delay has been encountered in the steel construction, but the company has made good headway with its blooming mill, which is now nearing completion.

Platinum Production in 1905.

WASHINGTON, D. C., October 30, 1906.—The ever increasing demand for platinum, coupled with conditions which have greatly reduced the output of the Russian mines, is directly responsible for a phenomenal rise in the price of the metal and indirectly for an increase of production in this country. The forthcoming annual report of the U. S. Geological Survey on the production of platinum in 1905, of which an abstract is presented below, gives the output in this country as 318 ounces, valued at $5320, as against 200 ounces, valued at $4160, in 1904. By far the larger supply of this metal comes from abroad. The imports in 1905 were valued at $2,173,263, as against $1,879,155 in 1904, an increase in value of $294,108.

The imports in 1905 were distributed as follows: Unmanufactured, 1598 lb. ($296,883); ingots, bars, sheets and wire, 6228 lb. ($1,688,224); vases, retorts and other apparatus, vessels and parts thereof for chemical uses, $186,742; manufactures of, not specially provided for, $1414. The imports in 1903 were valued at $2,055,933, in 1902 at $1,987,980, and in 1901 at $1,695,895. Considering the increased demand for platinum, the gain in importation is slight, but if the high price and scarcity of the metal be taken into account the wonder is that there was not a large decrease in the quantity imported.

Decline in Russian Production.

The yield of the Russian platinum placers, which usually furnish about 90 per cent. of the world's supply, has been greatly reduced by the unsettled condition of affairs in that country. The anxiety felt by platinum dealers during the Japanese-Russian war has not abated since the settlement of international affairs, but, if anything, has increased, owing to the internal troubles which Russia is experiencing. In fact platinum mining was entirely stopped for a considerable period and the manufacturers, both here and abroad, were forced to depend upon reserve stocks of the metal for their supply. Furthermore, before these uprisings it is said the large Russian mines were purposely curtailing their production. This reduction of the output is due to the fact that the entire product for a varying term of years was bought up under contract and at prices that now seem ridiculously low. The mine owners, receiving only the fixed price, do not participate in any gain due to rise in value and are therefore not anxious about a large production, but are husbanding the limited resources of their mines until such time as they can dispose of their product to better advantage. Meanwhile the small mines, which generally speaking are not hampered by such agreements, are working to their full capacity to take advantage of the stimulated prices, but their entire output is but a small percentage of what is usually produced. This stringency of supply, together with a greatly increased consumption of the metal in the electrical and chemical industries, accounts for the prevailing high prices.

At present ingot platinum is quoted in New York at $34 per ounce. In December, 1904, the price of the metal advanced from $18.50 to $19.50 per ounce, and early in March, 1905, a further increase to $21 per ounce took place, the ingot metal surpassing gold in value. On April 1, 1905, the price fell to $20.50 and remained firm at this quotation until February 1, 1906, when it jumped to $25 per ounce, where it remained until September. The average weekly quotation for 1905 was $20.34 per ounce for ingot metal at New York.

The exhaustive tests and examinations of black sands, commenced early in 1905 and still being carried on at Portland, Ore., by the United States Geological Survey, have done much toward placing platinum mining in this country upon a stable footing and developing it into a permanent and profitable industry. Not only have many discoveries of platinum in new localities been made and the limits of the known platinum bearing areas been extended, but the tests have revealed the fact that there are in this country districts which contain surprising quantities of platinum, and they have also given much valuable data as to the best methods of obtaining it.

Deposits of Platinum.

Platinum is now known to exist in 15 counties in California, 9 counties in Oregon, 8 counties in Idaho, 4 counties in Colorado, 3 counties in Washington, 2 counties in Montana, and in one county each in Utah, Arizona and Wyoming. The metal is also found in Alaska and in the gold bearing sands of the Corozal River, Porto Rico. Isolated occurrences of single nuggets or mere traces of the metal have been found in many other counties in the States mentioned, as well as in four of the Eastern States, namely, New York, Pennsylvania, North Carolina and Georgia. In many of these localities, however, the metal occurs but sparingly. The most promising fields are in the counties of southern Oregon and northern California. Here the metal has been proved to exist in commercial quantities and, with a proper knowledge of methods of obtaining it, there is no reason to doubt that an output of considerable proportions could be made annually.

The platinum metals are obtained in most cases as a by-product in working gold placers, especially where the gravels are derived from peridotites. The pyroxemites, gabbros, diorites, and sometimes the syenites also furnish favorable associations for the metal. In most cases the platinum is accompanied by chromite, ilmenite, and magnetite sands. In rare instances it is also found in veins, generally associated with the copper sulphides, as in the Rambler mine, Wyoming, and in North Carolina. It also occurs disseminated, in the native state, through certain basic eruptive rocks, especially the peridotites; and all formations where chromite or serpentine occur in any quantity should be carefully examined for the metal. A very interesting occurrence of platinum in massive chromite from Anacortes, Skagit County, Wash., was discovered by the United States Geological Survey in the course of the tests already referred to.

Mining Methods.

In the United States the mining of platinum is slowly advancing from its hitherto obscure position, and bids fair in the immediate future to occupy a much more important place among the mining industries of the country. This condition of affairs has been brought about largely as a direct result of the tests and experiments conducted by the United States Geological Survey at Portland, Ore., in connection with the Lewis and Clark Exposition at that place in 1905. These experiments, which were conducted under the immediate supervision of Dr. David T. Day of the Survey, have succeeded in establishing two facts: First, that the platinum bearing gravels of this country are of no mean extent nor small value; and second, that the methods by which the best results in working the deposits may be obtained have been clearly pointed out. Further, these experiments have conclusively shown that from 95 to 98 per cent. of the precious metals, both gold and platinum, contained in the sluice box sands can be saved on concentrating tables of the Pinder or Wilfley type, such as are used in every-day mill practice; and that in most cases the concentrates thus obtained will represent less than 1 per cent. of the total weight of sand fed to the table.

In some cases, where the sand is especially heavy and the precious metals extremely fine, such a high ratio of concentration cannot be effected without some loss. In many cases, also, it has proved good practice to use only a small part of the material at first and to rerun the concentrates from this preliminary treatment in order to obtain a second and final concentrate. The methods are described in detail in the report of the Geological Survey, and therefore will not be discussed at greater length here. The concentrates from the tables are generally rich enough to ship directly to some smelter, but it is not only possible but perfectly practicable to clean them successfully at the concentrating plant. The best method of doing this will of course vary greatly according to the character of the concentrates. W. L. C.

The Republic Iron & Steel Company is now using the hot metal process in its Bessemer steel plant at Youngstown, the hot metal being hauled over its own tracks from its two blast furnaces at Haselton, Ohio.

The Everett-McAdam Blue Print Machine.

Many features of decided advantage appear to be embodied in the Everett-McAdam continuous electric blue printing machine illustrated in Fig. 1, manufactured by the Revolute Machine Company, 523 West Forty-fifth street, New York City. In connection with Fig. 2, which is a cross sectional diagram through the part which is involved in the actual work of printing, the following description, taken from a circular issued by the company, will make clear the principle:

"The machine consists of a rotating glass cylinder which lies in a series of narrow belts and within which cylinder are placed two mercury vapor electric lamps. The roll of paper to be printed is placed in a box on top of the machine and feeds in continuously between the belts and the cylinder; or, if only a few prints are wanted, previously cut sheets of paper may be fed in. The tracings are inserted between the paper and cylinder, and after passing around three-fourths of the circumference of the cylinder are deposited with the paper in a box in the front part of the machine, the printing being done from the inside of the cylinder as the paper and tracings travel around it."

This machine successfully accomplishes continuous blue printing by electric light and is capable of making prints 5 ft. wide and of any length in which it is possible to procure the paper. The device is particularly adapted to making numbers of small prints on one long sheet of paper or on cut sheets, and all will be of an absolutely uniform tone. One special advantage of this continuous machine is that it is only necessary to handle one tracing at a time, the small ones being fed in side by side, one after the other, while the paper feeds in automatically from a continuous roll. The tracings go in and come out on the same side of the machine, so that

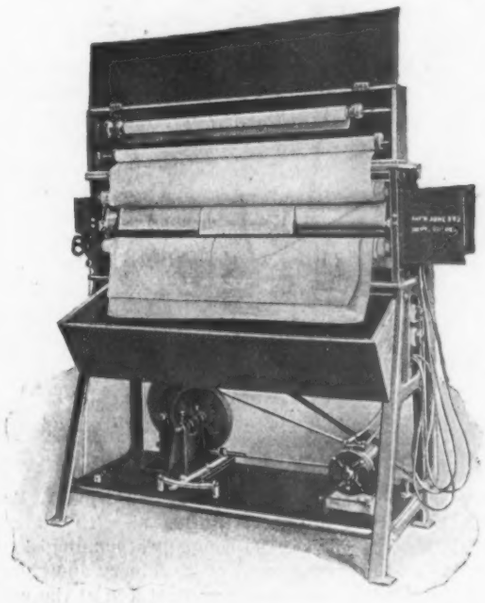


Fig. 1.—The Everett-McAdam Continuous Electric Blue Printing Machine.

the leading edge of a tracing may be fed into the machine before the trailing edge comes out, saving considerable time where more than one print is wanted from one tracing. This was very nicely illustrated by making 12 prints from one 6-ft. tracing on a single sheet of paper 72 ft. long without wasting an inch of paper or a second of time between prints. The use of a number of 1½-in. belts, instead of a single broad one, for holding the paper and tracings in contact with the glass cylinder gives absolutely perfect contact, so that there can be no spots where the printing is not sharp.

The lamps used are particularly adapted to this kind of work, as they give out only chemical rays, no energy being lost in nonchemical light, and as the printing is done from the inside of the cylinder the light strikes the paper at right angles and the machine has an absolutely maximum electrical efficiency. A reflector on that part of the cylinder uncovered by the paper in process of printing serves the double purpose of preventing light from striking the paper before it enters between the belts and cylinder and returns the rays of light, which would otherwise be wasted, at at least half their intensity.

The machine is very compact, requiring a space only 2 x 5 ft., and is entirely self-contained. Very little power is required for the drive, which is afforded by a motor on the base of the machine. The motor runs at

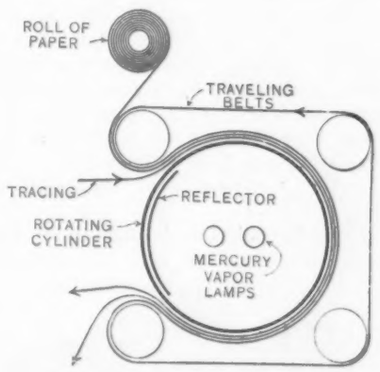


Fig. 2.—Detail Showing the Course of the Paper and Tracings.

a constant speed, but through a variator the speed of the cylinder can be instantly changed to any rate desired by moving a convenient lever. The speed variator is a simple device consisting of two disks set side by side, one behind the other, with a movable roller between. The driving disk is belted to the motor and runs at constant speed; the driven disk is belted to a shaft carrying a worm, which meshes with a worm wheel on the shaft of the lower front one of the four rolls which carry the belts surrounding the cylinder. When the roller between the friction disks is moved toward the center of the driving disk it is also moved away from the center of the driven disk and the speed of the cylinder is retarded. The opposite movement of the roller accelerates the cylinder. To avoid stopping the motor when the cylinder is to be stopped temporarily the worm driving the lower front roll is arranged so that it may be retracted from the worm wheel by stepping on a foot button near the front of the machine. This leaves all of the rolls free and a tracing started crooked or creased may be easily withdrawn and re-entered.

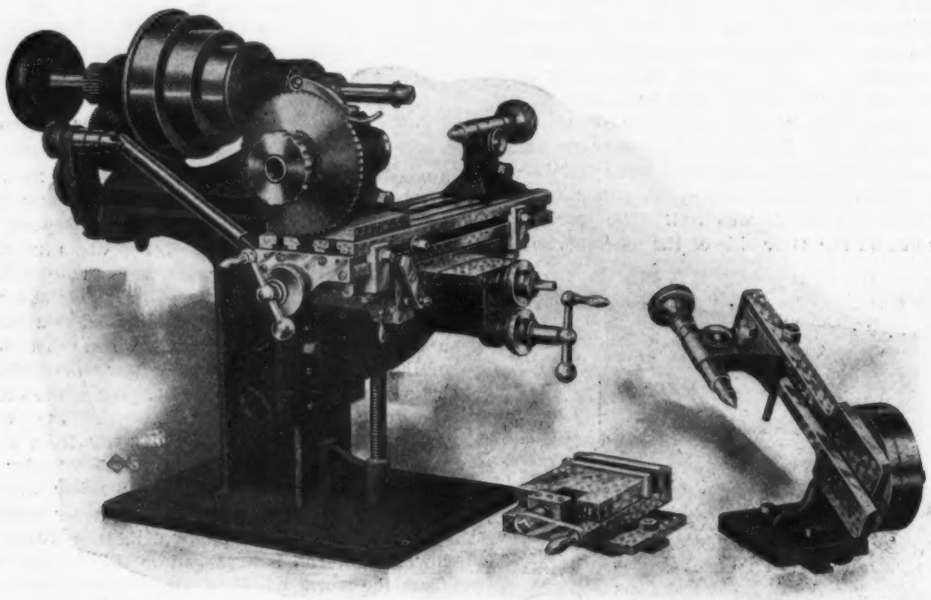
The results of experiments in the machine shops of the Bethlehem Steel Company to determine the power required to operate elctrically driven planing machins are given by the *Electrical World*. The first machine tested was a 36 in. by 36 in. by 14 ft. planer. The motor was a 10 hp. shunt motor running at 650 rev. per min. at 220 volts, the weight of planer table being 10,550 lb. The work consisted of a cut on nickel steel, the depth being 7-16 in. and the length of cut 21 11-16 in. It was found that 1490 watts were used to cut the metal out of a total of 9030 watts supplied. This gives 16.5 per cent. of useful power, the rest being lost in motor, gearing and friction. The total time for a complete cycle was 8.7 sec., and the actual cutting took place during 4.86 sec. Thus 56 per cent. of the time of whole stroke was employed in cutting. The over-all efficiency of the machine was thus 16.5 × 0.56, or 9.2 per cent.

Shipments of iron ore from the important deposits in the north of Sweden are restricted by Government regulation. In view of the favorable condition of the iron market the mining company has secured leave to ship 400,000 tons additional this year and 600,000 tons additional in 1907. The stipulated quantity is 1,200,000 tons a year and an increase of 300,000 tons for this year had already been granted.

The New Cataract Bench Miller.

A new bench milling machine, in which have been incorporated some of the attachments of the new Cataract bench lathe, is being manufactured by Hardinge Brothers, Chicago. The table of the milling machine drops 7 in. from the center of the main spindle, is 12 in. long and has three T slots. The table has power cross feed if it is driven by the regular screw cutting attachment used for the bench lathe. All feed screws are supplied with 1½-in. index, reading in thousandths of an inch, and are constructed on the same principles as those in the new Cataract slide rest. The main head is the same as is used on the Cataract No. 3 lathe, and has a ½-in. hole through the spindle. The dividing head allows a 4¼-in. swing and carries a 4-in. index plate. The Cataract No. 3 chuck is interchangeable with the head. This same dividing head is used in connection with the adapter shown at the right in the engraving, without removing the tailstock, thus enabling the head to be set at any angle up to 45 degrees. It is suitable for small taper and tap work, having a tailstock that can be kept in proper alignment.

A small vise is made for the milling machine, which enlarges the range of its applicability. The milling attachment for the new Cataract bench lathe is identical in every way with the milling feature of this machine with the exception of the main frame. The proper hight for the frame above the bench is obtained by raising the head 3 in. higher than the top of the bed. The countershaft that is used with the lathe has two cones and is gear driven. Taking the head from the lathe and placing it upon the milling machine, the same length of belt is retained. The shifting of the belts for the countershaft is accomplished in a substantial manner, the rods and handles being balanced by the weights hanging under the countershaft. Where foot treadles are desired the same treadles can be used as were used in the old style. The countershaft has a splined shaft for the high speed grinder pulley and is suitable for all purposes in connection with the bench lathe. It is made in the ordinary way to go on the wall, or to be supported on a 1¼-in. gas pipe.



The Cataract Bench Milling Machine, Built by Hardinge Brothers, Chicago, Ill.

An important merger of electric light companies in the vicinity of Pittsburgh, Pa., has been completed whereby about 30 plants will pass into the control of the West Penn Electric Company October 24. The towns that have gone into the combination are Charleroi, Brownsville, Monongahela City, Smithfield, New Haven, Greensburg, Vanderbilt, Everson, Youngwood, Youngstown, Belle Vernon, Carroll, Fallowfield, Fayette City, California, Coal Center, Stockdale, Rostraver, Speers, West Pike Run, Twilight, Monessen, North Charleroi, Allen and Elco. The operating office of the company is at Connellsville, Pa. William S. Kuhn is president; James S. Kuhn, vice-president; R. P. Watt, secretary; J. Von Wagoner, treasurer; H. F. Barnhard, purchasing agent, and W. E. Barnhard, superintendent. The company is controlled by Pittsburgh capital and is affiliated with the West Penn Railways Company, which operates trolley lines in the district in which most of the above cities are located.

Grinder Talks at the Boston Metal Trades Meeting.

The Boston Metal Trades Association enjoyed an especially instructive and entertaining evening on the occasion of its monthly meeting and dinner, October 24, the occasion being devoted to "Grinders," with talks by experts in this form of metal working. The meeting was held at the Parker House, Boston, with President Fred F. Stockwell of the Barbour-Stockwell Company, Cambridge, in the chair. There was a large attendance of members and guests.

After some routine business had been completed, J. J. Thacher of the Brown & Sharpe Mfg. Company, Providence, R. I., read a paper, illustrated with numerous lantern slides, describing the company's grinding departments, giving the arrangement of machinery and showing the line of grinding machines manufactured at the works. Charles H. Norton of the Norton Grinding Company, Worcester, Mass., made an address on abrasive wheels, especially the alundum wheels manufactured by the Norton Company, Worcester, and the methods and practice of grinding of the Norton Grinding Company, builder of heavy cylindrical grinding machines. Mr. Norton gave much useful information as to comparisons of time required to do work on grinding machines as compared to older methods, and of the combined use of lathe and grinder in doing cylindrical work. Edward Rivett, of the Rivett Lathe Mfg. Company, Faneuil, Mass., was also to have spoken, but unfortunately the flight of time interfered with this part of the programme.

On Saturday, October 27, the members of the Engineers Society of Western Pennsylvania, with headquarters in Pittsburgh, visited Conneaut Harbor, Ohio, to inspect the ore docks of the Carnegie Steel Company,

The Tin Deposits of the Carolinas.

WASHINGTON, D. C., October 30, 1906.—The results of an elaborate investigation of the tin deposits of the so-called Carolina Tin Belt, which extends from the center of Cherokee County, South Carolina, across Cleveland and Gaston Counties, to Lincoln County, North Carolina, have been incorporated in a bulletin prepared by L. C. Graton and about to be issued by the U. S. Geological Survey. Through the courtesy of Director Walcott the following abstract of this interesting monograph has been secured:

Location of Mines and Production.

Recent operations of anything more than a preliminary character have been carried on at only three places. These are the Jones, Faires and Ross mines. Considerable prospecting in the way of trenches and pits has been done by parties in the northern section of the belt. The property known as the Jones mine is situated about 7 miles northeast of Kings Mountain and about 3 miles northwest of Bessemer City, stations on the Southern Railway. The mine is owned and operated by the Carolina Tin Company, Charlottesville, Va. The Faires mine is located about 1 mile southwest of Kings Mountain. The Carolinas Tin & Development Company, Gaffney, S. C., holds an option on it. The Ross mine is about 1½ miles southeast of Gaffney, S. C., and at present is being worked by the owner, Capt. S. S. Ross.

The only production from the district of which there is accurate record is that from the Ross mine. This amounted to 38,471 lb. of cassiterite concentrates in 1903 and 35,925 lb. in 1904, a total of 74,396 lb. of concentrates. The actual total content of metallic tin is now known to the writer. The 1903 shipment is said to have run about 70 per cent. tin, and according to assays by Ledoux & Co., the 1904 shipment averaged about 66 per cent. On the assumption that the entire output to date has averaged 66 per cent. tin, the total amount of metallic tin shipped from the Ross mine has been about 50,000 lb., or 25 tons. A few thousand pounds of concentrates are now ready for shipment at this time and nearly a carload has been produced at the Jones mine. From these two sources perhaps at most 20 tons of metal may be obtained. Two carloads of ore sent to England by Ledoux in the early days of activity in tin mining are said to have averaged about 2 per cent. metallic tin; the total amount could not have been over 1 ton of metal. If to this is added the amount of cassiterite that has been carried away as specimens and samples for assay, it is found that the total production of metallic tin from the Carolinas is probably not over 50 net tons. A considerable portion of this amount, probably over half, was derived from lodes, or at least from deposits in place.

Economic Importance of Deposits.

Three ore bodies in the district have been prospected by underground workings. Results at the Faires mine were unsatisfactory. It is doubtful if the average content of the whole ore shoot at the Jones mine will reach 5 per cent. of concentrates. At the Ross mine the percentage of cassiterite in the ore shoot may have been somewhat greater, but at the present level of working it is probably under 5 per cent. There is no reason to believe that the average richness of the ore in the deposits, considered collectively, will change with depth.

The metallic content of the concentrates can only be inferred from one case. While small selected samples of cassiterite may reach 75 per cent. metallic tin, the general run of the concentrates will fall considerably below that figure. Of the second shipment from the Ross mine 1860 lb. averaged 72.53 per cent. tin, 29,376 lb. averaged 70.31 per cent., and 4689 lb. averaged 36.50 per cent.—in other words, about seven-eighths averaged over 70 per cent. and the remainder about 35 per cent., the average metallic content of the whole shipment being about 66 per cent., which is a very good grade for lode tin. It is known that considerable care was exercised in the preparation of these concentrates, so it may be that this figure is rather above the average for the region. The almost entire absence of other heavy minerals in the pegmatite and the purity of the cassiterite itself, however, make it fairly certain that careful concentration will give a clean product of good grade. If the figure for the Ross shipment is the average for the region, it means that every 3 lb. of concentrates contain 2 lb. of metallic tin.

Size and Extent of Deposits.

The width of the ore bodies is limited to that of the dikes in which they occur and is in many cases narrower. The average width of those ore shoots which have been explored is probably not over 3 ft. and more likely even less. The breadth of the shoots—that is, the dimension in the plane of the dike at a right angle to the pitch, or greatest dimension of the shoot—is less easily determined by a small amount of development. Twenty-five feet is probably a maximum for those already known. The pitch length—the greatest dimension of the shoots—is thus far unknown; but indications are that the concentration of tin in certain parts of the dikes is controlled by factors which are variable and rather easily influenced by surrounding conditions, so that the ore bodies may be expected to be of irregular extent longitudinally.

The fact that the ore bodies represent magmatic segregations from an igneous rock, argues, on the other hand, strongly in favor of the probability that there is just as much cassiterite at a depth of 100 or 500 ft. as at the present surface. It is not, however, certain, nor even likely, that the majority of ore bodies known at the surface will continue without interruption to great depth. Maintenance of a fixed output as depth is attained will therefore mean increasing cost of exploration, aside from the commonly increasing cost of hoisting, pumping, and other operations with depth.

The prospecting that has been done during the 25 years since the discovery of tin in this region should furnish some idea of the extent and number of the ore deposits. While it is highly probable that some additional deposits will be found, there is no reason to expect ore bodies of much greater size or richness than those already known. If anything, the probabilities are that the best ore has been already discovered. Furthermore, it is reasonable to suppose that the ore shoots already explored are as good as, or—since mining usually begins at the most promising points—better than those whose existence is known but which have not been developed.

At the Faires mine the material of the dikes was so decomposed that most of it could be broken down with a pick, and blasting was only occasionally required. Drifting in ground of this description, with a short underground tram and a hoist of 40 ft. by windlass, is said to have cost $1 to $1.50 per foot. Sinking would cost more. At the Jones mine, according to reports, work in the hard rock is easier and cheaper than in the decomposed material. At the Ross mine, also, where the rock for the first 80 ft. is so decomposed that it is extremely soft, the increased ease of "breaking" it is much more than offset by the care and the timber required to hold the ground. Shaft sinking below the water level under these conditions is exceedingly slow and expensive work. A contract for sinking the two-compartment shaft 50 ft. from the 80-ft. level, through ground which is rapidly becoming hard, has recently been given for $25 per foot, the company furnishing the machinery. Up to date the tin taken from the deposit in place has cost a little more than twice what it cost to extract the cassiterite from the surface gravels by placer methods.

Conclusions.

The foregoing considerations indicate that the future of the tin industry in the Carolinas is not yet assured. It is believed, however, that in the case of some of the deposits conservative, careful and systematic mining will be attended with profit. There are a number of prospects of sufficient promise to warrant further development by cautious methods.

The profits made at the Ross mine, which were probably large compared with the expenditure, are not to be taken as a criterion, for a large part of the product of that mine required only washing, and most of the remainder has been derived from soft ground which required no blasting nor crushing. W. L. C.

THE IRON AGE

1855—1906.

New York, Thursday, November 1, 1906.

DAVID WILLIAMS COMPANY, ... PUBLISHER
CHARLES KIRCHHOFF, ... } EDITORS
GEO. W. COPE, ... }
A. I. FINDLEY, ... }
RICHARD R. WILLIAMS, ... HARDWARE EDITOR

The Prolongation of Prosperity.

The question of the probable duration of this period of remarkable prosperity in the iron trade is agitated at the present time not so much because the problem offers reasonable prospect of correct solution, but because of the obvious value of any approach toward a correct solution. Moreover, there are hastily formed impressions which without adequate reflection may exert an unwarranted influence.

A great deal has been said, for example, in discussing influences originating in the iron trade itself, about the benefits derived from the establishment of an era of steady prices. Certain things have been shown to result from steady prices, but the logic of these things must be taken strictly or a most dangerous fallacy may be introduced. What has been proved is that steady prices in the principal steel products reduce the fluctuations in demand in a period which, in the old order of things, would be subject to moderate fluctuations in prices and demand. The influence of steady prices has been proved as regards such a period as that from the close of 1898 until, say, when the Steel Corporation was in good working order; or, for another instance, the few years closing with 1892. But no correct syllogism can be constructed therefrom for such periods as set upon the American iron trade in 1873 or 1893, because the era of steady prices has not embraced conditions which existed in those times. The satisfaction felt by the iron trade at the establishment of an era of steadiness in certain finished steel prices has not been based upon theorizing as to what steady prices should do, but purely upon what it has been observed they have done.

To speculate upon what steady prices may do in a period where conditions are such as prevailed in the years following 1873 and 1893 there must be an entirely new basis for reasoning. At the outset the general point must be conceded that steady prices tend rather to regulate and distribute demand than actually to create it. One may pass in review all the important channels of iron and steel consumption and see the same general picture, namely, that with no early prospect of important change in prices wants have been anticipated or buyers have not deferred the satisfying of wants already felt. Railroads, for instance, have relaid such rails as were naturally required. They have neither laid rails this year where the renewal could have been postponed to next year, nor have they stretched a point and deferred to next year renewal work which ought to be done this year. In buying steel cars they have bought neither more nor less than they should, since they have needed all they have bought, but could not have secured deliveries on larger numbers because they have kept the steel car plants fully employed as it is. In the erection of steel buildings the question of prices has not entered, only that of ultimate utility. In the lighter lines, which are handled so largely by jobbers, buying has been chiefly with respect to prospective requirements rather than with respect to prospective prices.

Consumers have probably refrained from overbuying, while they have anticipated requirements in so many cases because to wait a moderate time would probably not enable them to buy at lower figures. There is, however, a positive limit to such anticipation, which is measured in months rather than in years. The depressions which began in 1873 and 1893 lasted for several years. It is easily conceivable that, on the eve of such a period, consumers would not only refrain from anticipating any requirements, but would refrain from buying even for the nearby future. Thus a period of steady prices would have the tendency to increase buying during its existence, but to decrease buying toward its close, as compared with what would have been the experience under the old order of continual fluctuations. The influence of steady prices being to direct the fruition of demand into orders, rather than to create ultimate demand, no other result should be anticipated. Absolutely new uses for a commodity are more likely to be found when prices for that commodity are relatively low, as regards both their own averages and the prices of the competitive commodities.

The Wall Street lamb is the subject of ridicule because he buys a high priced stock on the basis: "This stock is bound to advance; see how much it has advanced already!" The same reasoning has been applied to our iron and steel production, and has not met with so much criticism. Men may point out, for instance, that our pig iron production has grown from 9,200,000 tons in 1890 to 15,900,000 tons in 1901, or over two-thirds, and from that figure to 25,000,000 tons this year, an increase of nearly two-thirds, or a total gain in 16 years of 171 per cent. Unfortunately, however, prosperity in the American iron trade does not at all depend upon demand, *per se*, but upon the relation of demand to productive capacity. That capacity has, generally speaking, increased just as rapidly as demand. There is a scarcity of pig iron now, but had the present new erection been a year earlier the case would have been altogether different. Had the prospective capacity for next year met the demand experienced this year there would have been an ample supply. The capacity once established must be reckoned with; demand may decrease, but the capacity remains. Moreover, in 1890 many operations were conducted under conditions which were passing out of date, and their relegation to the abandoned list a few years later was accomplished with little disturbance. To-day, with trifling exceptions, producers are strongly entrenched and cannot easily be forced to retreat. In addition, the strongest producer of all is likely, from its size and the necessary openness of its transactions, to prove a particular menace in closely competitive times.

In view of the disposition occasionally shown to consider the present pace in the iron trade as a newly established normal, this may be said: In 1890, when the United States produced only 9,200,000 tons of pig iron, the American people were civilized. They were not in the stone age, nor yet in the bronze age. They had roofs over their heads and means of communication and transportation. They were not without means of subsistence, nor yet of recreation and enjoyment. They will have increased in numbers by only 36 per cent. from 1890 to the beginning of next year, when the trade is prepared for a production of pig iron practically three times as great as in 1890.

In the reasoning which holds out prospects of large exports relieving the American iron trade when a seri-

ous depression sets in there is the same fallacy as has been pointed out with respect to the influence of steady prices in a period of greatly decreased demand. The recent experiences with exports have been in short periods where the American trade had but a relatively small surplus to dispose of, and where the slight recession in domestic demand which produced that surplus was purely local. The trade was successful in the export movement, but it does not follow that it would be as successful in different conditions. The next time the American iron trade seriously faces the export question it will be under distinctly different conditions in two respects: the depression will be from causes extraneous to the iron trade and world wide, and the quantity of surplus material will be much larger. Other nations will be eager to increase their exports, while the demand from nonproducing countries is really not very large. As has been shown with convincing figures, the iron and steel exports of the producing to the nonproducing countries have not grown in the past few years at nearly so rapid a rate as the production. That 1,000,000 tons can easily be exported in a year does not prove that 2,000,000 tons can be exported at all.

The next depression in the iron and steel trade may be remote, but whenever it comes it should not be expected that precedents formed in totally different conditions will govern the outcome.

The American and the British Shopman.

Comparisons have been made between British and American shops in respect to equipment, methods, quality of product, efficiency of working force, *esprit du corps*, the development of mechanical ability and other matters of large and small importance. The experience of the various writers and their facilities for observation in the two countries, not to mention temperament and ability really to see, have had much to do with the diversities of statement, that sometimes are so marked as to raise a question of good faith. It is not unusual, for example, for members of delegations making a two or three weeks' tour of the United States to carry on shop investigations on the plan of a two hours' walk through a large plant. We recall cases in which such visitors went home and reported that they found no special evidences of superiority to British methods, while in certain particulars mentioned they were persuaded the British way was to be preferred.

But testimony is to be had from those who have lived in both countries and have had shop experience in both, and who speak from observations sufficiently long continued to form a basis of a fair judgment. One of these, James Blount, contributes to the *World's Work* the impressions of "An English Mechanic in America." Some of the familiar statements concerning English workmen are repeated—their superiority to Americans as all-round mechanics; their unwillingness to operate two or three machines or to sharpen tools while a cut is being made, or to do anything more than wait for the completion of that operation; the barriers between men and foremen, in contrast with the easy footing here, tending to cooperation by workmen with foremen and superintendents in getting out work. In English shops, we are told, "soldiering" "is common early in the day before the arrival of the late coming foreman," and in other ways the working time is brought down nearer six than nine hours. In English shop products all parts are finished with equal care, regardless of relative importance, and often unnecessary expense is put on polish and decoration. The Yankee takes a pride in the quantity of his output, while the union bound Englishman lingers over his job. Yet we are assured that on coming to the United States the English workman imbibes the native spirit of restlessness and energy, the undeveloped better qualities in him are brought into play, and all this, coupled with his general mechanical superiority, as contrasted with the specialization of the American mechanic, soon brings to him the most responsible work in the shop.

The scale of living of the American mechanic is found to be higher than that in England; intemperance and gambling are more common there than here, and the position, advantages and compensation of the American apprentice are much to be preferred. In the American works in which the writer of the article is now engaged the apprentice receives at the end of his term a bonus as large as the ordinary premium he must pay in England before he enters the shop. Concerning ambition and opportunity this is said:

> The ambitions of the younger generation of workmen in the two countries add another layer to the foundation for the superiority of the American. In England, with possibly a few exceptions, the workman has practically no ambition beyond becoming a good journeyman mechanic, or the questionable ambition of having enough to enable him to lay a few bets on the races and to treat his friends. But this no doubt is due to the existing social laws of England. In America there is no limit to his ambition.
>
> Although there are undoubtedly equally good opportunities to obtain education in the two countries, only the American seems to want to take advantage of them. In short, the American looks ahead all the time; the Englishman is perfectly content and satisfied with his present level. America is steadily producing a generation of mechanics, highly trained, not only in the practical but also in the theoretical side of their business, who are prepared and qualified when opportunity occurs to step into higher and more responsible positions; and the way in which inventive genius is fostered and encouraged is bound to tell.
>
> Can we then wonder that the products of this country are slowly but surely gaining in the markets of the world and making the United States the foremost commercial nation on earth? It is simply a case of the victory of an educated workingman with high ambitions over an uneducated man with lower ambitions.

All of which will find ready acceptance in the land of the writer's adoption, though we shall probably not look in vain to see his picture of British conditions attacked on the other side as overdrawn and not typical. And yet again the high place he gives the acclimated Briton in American shop economy may help to stem the rising tide of criticism from his old compeers.

The Demand for Rolling Mill Machinery.

The builders of all types of rolling mill machinery report unprecedented activity on the part of the mills in preparation for next season's business. An increase in tonnage of immense proportions is indicated by the volume of inquiries and orders. There appears to be no exception in the general demand. Billets, rods, structural shapes, plates, sheets, bars and merchant stock all appear to be destined for very large increases in production in 1907. Practically all the new work will be done for established plants, the promoting element not being taken into consideration in the estimate of the situation, nor, in fact, has it made an appearance to any great extent to the builder of rolling mill machinery. Such plans of this description as do exist have not reached the point of buying equipment, nor that of serious inquiry. In spite of the promised extensions of capacity the growth as planned should not be considered abnormal, in the face of the shortage of rolling mill products.

The High Speed Steels for Woodworking.

Builders of woodworking machinery assert that they have demonstrated to their complete satisfaction that the high speed steels are destined to bring about radical improvements in the woodworking industry, and some even go so far as to prophesy that it will be revolutionized in the near future. The steel has been in use for these purposes for some little time, but in a limited way. Its usefulness has been hampered by a lack of knowledge of its characteristics as applied to the machining of wood, and it was only recently that tests have been concluded which give to the mechanical engineers employed by the builders of woodworking machinery something approaching exact knowledge of how the steel will work under the various conditions of this industry; where its real usefulness lies; the speeds and feeds which may be employed to best advantage; its wearing qualities and their application to cutting edges, and so on into minor details. The tests made by one of the best known and largest of the woodworking machine establishments brought out these general facts:

The rate of feed may be nearly doubled.

The cutting knives keep an edge from 3 to 10 times as long as the old steels.

The knives may be ground with a better edge.

The sharpening of knives may be done to advantage without removing them from the head.

A slower speed of knife head is entirely practicable.

Most interesting, and probably most important of all, is the knowledge that the real value of the new steels in woodworking lies in the finish given the work. The advantage in roughing out heavy work, or in other heavy duty, is secondary to that of finish. The new steels will do more work than the old, according to these tests, but it is not for this that it will be especially valued, or that it will act as a revolutionary agent, if so great a change in the industry is to be effected. These statements will sound somewhat paradoxical to those who employ the new steels in working metal, where they have been of little or no value in finishing work, though of exceedingly great importance in heavy or rapid reduction. But, according to these tests, in working wood the quality of the steel is such that, to take a test of planing as an example, instead of a succession of knife marks there is a clean, unmarred surface, with a glossiness similar to that obtained in a sanding machine. Sample boards planed at the rate of 105 ft. a minute showed this characteristic, and they included several varieties of both hard and soft woods. It should be noted that 60 ft. a minute is a high rate of feed for planing with the carbon steels.

Probably the reason for this better finish lies in the durability of the steel, which renders it possible to give the knives a keener edge, in the knowledge that it will stand up to the work for a reasonably long time. One occasionally hears of an expert woodworker who, using the ordinary knives, has planed to a finished surface, free of knife marks, but this was under exceptional circumstances, at slow feed, and perhaps with knives specially ground for the purpose. Under the new conditions, according to those who have made the tests, finished surfaces should become the universal practice in planing machines, and this at very high rates of feed. However, it must be remembered that tests are usually made under exceptional conditions, because the operators are working intelligently and even scientifically. The use of the new steel must be worked out into an accepted practice in its treatment of the steel as such, in methods of sharpening, the form of cutting edge, and in other ways that must become general in their acceptance before the steel can be applied successfully in a universal way. This will take some time, but nevertheless the development of the new practice will go on much more rapidly than formerly as soon as the manufacturers of woodworking machinery shall have adopted it as standard.

As to the use of the steel for heavy reduction purposes there should be an advantage in its use, as in metal, but not to such great extent. The faster feed and the better ability to maintain an edge will count for a great deal, but it should be stated that in the way of rapid reduction the old steels have been entirely satisfactory, and seldom has a task been found beyond the temper of the cutting blades. For special purposes, doubtless, the new steel will be valuable, as, for instance, in the machining of very hard woods. As for the form of the knives the tool holder is coming into vogue for the purpose, the blades consisting of thin, narrow strips securely clamped to the head.

CORRESPONDENCE.

The Gayley Dry Blast and German Engineers.

To the Editor: In the letter of J. E. Johnson, Jr., on this subject there are a few sentences which deserve notice, though, unfortunately, they contain nothing that is apt to throw new light on the cardinal point of the controversy, which is concerned with the question whether the dry air blast process as proposed by Mr. Gayley effects a saving on the cost of pig iron production large enough to warrant its more general adoption, or whether the contention of Prof. Bernhard Osann and other scientists is correct, who arrive on the basis of a careful mathematical analysis at the conclusion that the gain to be realized is only one-fourth of what is claimed by the advocates of the innovation.

In a discussion of this character it is obviously the proper attitude for all contestants to place before the discriminating engineering public figures against figures, instead of taking recourse to the ordinary instrument of indignant protest, which can make but passing impressions on the impartial observer. If a new apparatus or process shows on test a saving in consumption of 20 per cent., while through analytic calculation only 5 per cent. can be detected, it is evident that one of the two results must be wrong. But it is just as certain that we shall never succeed in tracing the cause of the difference as long as we content ourselves with decrying the character and ability of our opponents. Nor will this argumentation be clarified by drawing the double edged weapon of national prejudice in answer to the frank criticism of an international engineering problem.

What has the valuation of the Gayley dry air blast process to do with the fact that it was an American who first advocated the use of blast furnace gas engines in this country some years ago, or what matters it that the distinguished metallurgist is a German, who endeavors by careful scientific research to confine the merits of a novel technical process within legitimate economic limits? Does Mr. Johnson, in accusing a man of the standing of Professor Osann of intentional misrepresentation, realize that it is but fair to support his assertions by proper material, or else if he is not able to recognize in the calculations advanced by that authority more than a "hotchpotch of learned nonsense," that they are not for him the proper instrument to use for an attack? If Mr. Johnson is one of the blast furnacemen who understand the reasons for the savings claimed by the Gayley process, is it asking too much that he may impart such valuable knowledge also to other students of the problem whose business it is to advise people not conversant with the subject of its merits or demerits?

After all, the conversation of natural resources by economic methods of production is an international aim, whose realization is apt to benefit the whole of mankind, and whose restriction within national limits would cer-

tainly mean a narrow interpretation of the engineering ideal. As conditions stand now it appears that even American iron masters are aiming toward economy of production by utilizing the bountiful supply of blast furnace gases rather than by reducing the quantity and richness of these gases through the adoption of the Gayley process. At least the fact that the United States Steel Corporation has recently placed orders for over 100,000 hp. in gas engines is somewhat like a confirmation of this view.

F. E. JUNGE.

NEW YORK, October 29, 1906.

What the Steel Corporation Has Accomplished.

In the instalment of Herbert N. Casson's serial article on "The Romance of Steel and Iron in America" in the *Munsey Magazine* for November, the author gives the following summing up by Judge Elbert H. Gary, George W. Perkins and Henry C. Frick of what has been accomplished by the United States Steel Corporation in its five-year lifetime:

"What have we done in five years?" repeated Judge Gary. "Well, we have been so busy that this is the first time I have tried to sum up. In an offhand way, I might enumerate our achievements as follows:

"We have acquired extensive holdings of ore and coal of the best quality.

"We have increased the productive capacity of our furnaces and mills by about 33 per cent.

"We have reduced the cost of manufacturing by about 10 per cent. through improvements and bettered conditions.

"We have improved our organization, by the careful selection of men and by the interchange of ideas among the officials of the subsidiary companies. We have established a system of civil service throughout our plants, so that a competent workman can rise to his proper level.

"We have won the good-will of our employees by making 30,000 of them shareholders in the company, and by paying them an extra bonus for continued service.

"We have systematized and extended our foreign trade. We export 1,000,000 tons a year to all parts of the world, resulting in increased tonnage and profit to the company.

"We have established good relations with all public officials, by making public our affairs and inviting criticism.

"We are on friendly terms with all our competitors.

"We have been the most effective influence in maintaining stability—in preventing extremely low or extremely high prices.

"Last, and perhaps the greatest achievement of all, we have obtained a Finance Committee which has never been equaled, either for the high caliber of the men composing it or for the interest which they take in its work.

"As to overcapitalization," said Judge Gary, emphatically, "I want to say this: On the basis of the actual original cost of our properties, our stock issue was excessive. But on the basis of actual present value, estimating from what the properties would cost to reproduce today, or from what they can earn, there is no overcapitalization—not a dollar."

Mr. Frick, when asked to outline what the corporation had done in five years, was less sweeping in his claims.

"In the first place," he said, "it should be said that we have had five good years. There has been no panic—no hard year like 1896. If there had been such a year, it is a doubtful question whether or not the young corporation would have come through safely. It began business with less ready cash than it should have had. But trade was wonderfully brisk, and the company is now in good shape—much better than in 1903.

"I believe that a great mistake was made in beginning to pay dividends on the common stock from the first. Better have waited a while. But the common stock is today a good investment—not for small investors, but for large ones. It is only for those who can afford to wait—for those who can buy a large block of it, and hold on until the big dividends come. It is a speculative stock, not a steady one for those who have small incomes.

"If the company were to be mismanaged, we have every reason to believe that the Government would interfere. As long as it is well managed, as now, there will be no slump. There will be fewer ups and downs in the future than there have been in the past. To-day, if we have a bad year, we have the whole world market for a dumping ground. A slight depression does not hurt the trade. On the contrary, in my experience, I have found that it acts as a stimulant to bring down costs."

"The two greatest achievements of the United States Steel Corporation," said George W. Perkins, "are, 1, The rescue of the steel business from one man power and from a threatened industrial war which would have had the most disastrous results upon American industry; and, 2, the averting of a trade depression in 1903.

"Some sensational writers have said," continued Mr. Perkins, "that the United States Steel Corporation has caused a loss of tens of millions to investors. To make such a statement is unfair. Why don't they tell the public what it saved the country by keeping all the steel mills and furnaces running during an unavoidable depression of trade? The depression of 1903 was the first one in the history of the world in which the average steel worker didn't suffer severely.

"The fall in the price of stock was temporary. Those who held on lost nothing; and as for the corporation itself, it had enough money in the treasury to pull through without borrowing a dollar. Look back over the tragic history of steel companies, and you will see that this was a wonderful accomplishment."

The Chicago Pneumatic Tool Company.

The earnings of the Chicago Pneumatic Tool Company show steady improvement. In the nine months to September 30 the company earned $480,458 available for dividends, which is equal to 7.7 per cent. on the capital, or almost twice the requirements. The report for the quarter ended September 30 shows:

	1906.	1905.	Increase.
Net profits	$254,669	$241,791	$12,278
Depreciation, &c.	36,602	32,488	4,114
Balance	$217,467	$209,303	$8,164
Bond interest and sinking fund	41,250	41,250	.....
Available for dividends	$176,217	$168,053	$8,164
Dividends	61,088	61,138	*50
Surplus	$115,129	$106,915	$8,214

* Decrease.

For the nine months from January 1 to September 30 the income account compares as follows:

	1906.	1905.	Increase.
Net profits	$711,552	$655,732	$55,820
Depreciation, &c.	107,344	90,193	17,151
Balance	$604,208	$565,539	$38,669
Bond interest and sinking fund	123,750	123,750	.....
Available for dividends	$480,458	$441,789	$38,669
Dividends	183,263	183,413	*150
Surplus	$297,195	$258,376	$38,819
Surplus January 1	511,292	225,437	285,855
Surplus September 30	$808,487	$483,813	$324,674

* Decrease.

The company is extending its operations, negotiations now being under way for the purchase of another factory.

Robert W. Hunt & Co., engineers, The Rookery, Chicago, have been appointed consulting, designing and constructing engineers for the new municipal electric lighting plant for the city of Milwaukee by Chas. J. Poetsch, City Engineer. This appointment has been unanimously confirmed by the City Council, the site for the plant has been purchased and work will immediately start upon the plans and specifications. The estimated cost is $700,000.

The Baltimore Steam Packet Company has awarded the contract for a new passenger steamer to be a sister ship of the Virginia, the present flagship of the line, to the Maryland Steel Company. The steamer will be 306 ft. long over all, 56 ft. beam and 18 ft. 6 in. molded depth, propelled by one inverted direct acting triple expansion engine.

San Francisco Business Affairs.

SAN FRANCISCO, October 22, 1906.—The city is getting cleaned up under the energetic action of the president of the Board of Works, who has put a special corps of 600 men to clearing up the streets and sidewalks at the expense of the owners of the lots. The latter are not taking to the operation, but the appearance of the streets is undergoing a decided change for the better. An immense quantity of steel, iron, pipe, &c., is being disturbed *in situ* and thrown back on the lots, but of course cannot be left there. The owners, insurance companies or banks will be obliged to sell this material, the amount of which cannot be told, but which will certainly not exceed 100,000 tons. All of it will have to be removed from the lots to give a chance for building, and will be sold at rather cheap rates. There will be enough to supply our local shops with scrap iron for a long time. A great deal of iron work will be needed and many of the iron and cement buildings will be supplied with iron columns, &c., made here. This will give employment to local iron workers for several years and the scrap supply will lessen to some extent the demand for Eastern and foreign iron, especially pig iron. There has been very little of that at hand for quite a long while. The principal article of foreign import in the building way is now cement and a great deal of that is coming along. A very large number of new buildings is being planned or contracted for.

While most of those talked of or contracted for are frame buildings, about 30 per cent. are brick or reinforced cement, with a sprinkling of steel frame buildings accompanying them. Some of these will be seven to eight stories, and occasionally, as in the case of the buildings belonging to the Mutual, of New York, an additional story or two is being added. Buildings are being rushed up with great rapidity and another couple of months will make a great difference in the appearance of the city. Not that it will be like the old San Francisco; much of the building will be like that formerly seen, but there will be great gaps in the blocks and most of the buildings will be of a less desirable grade than those they have superseded. For a while lumber will take the place of brick, and the latter will take the place of formed steel buildings.

It will probably be four or five years before the great hardware houses will be as well housed as they were before the fire. The Pacific Steel & Hardware Company, on Seventh street, will long be a conspicuous exception to the general run of hardware houses. It has now a magnificent appearance from the street, especially when contrasted with the buildings around it. Baker & Hamilton will remain where they are in Berry street; so will Holbrook, Merrill & Stetson on Seventh street, and the Dunham, Carrigan & Hayden Company on Kansas street. Their location in Turk street near Van Ness will serve W. M. Montague & Co. for a long time. South of Market street the great manufacturing section is already telling what it will be—three to four story brick buildings here and there—but the most of them of corrugated iron or lumber, and generally not higher than three stories.

As time goes on most of the insurance companies are beginning to deal more liberally with the policy holders than at one time feared, and a number of them report having paid out in round numbers an aggregate of $100,000,000. The total paid out by those reporting and not reporting is estimated at $130,000,000, and it is now concluded that there will be paid altogether about $180,000,000. This will of course not allow of a better style of buildings being erected, but will inspire much more spirit in the citizens generally.

The fall trade has been and continues to be of very good volume. In this line all has been handled from this city, though all the goods have not come to the city, some of them having been distributed before reaching it. The matter of transportation has been the most troublesome to deal with; in many lines much more goods could have been sold were it only possible to obtain them. But the railroads have been congested and the merchandise could not be delivered. As the year goes on, however, much of the delayed goods will come to hand, and the fall trade will be perforce extended to the first of the year. The absence of rain gives rise to some uneasiness. It, however, gives a good chance for the rebuilding of the city.

The Southern Pacific has put out a statement wherein it promises to build a large extent of road during the coming year, and the Western Pacific is doing the same. Should these promises be fulfilled everything in California will be kept very lively and the money spent will help every line of business. J. O. L.

The Ohio Valley Improvement Association.

The twelfth annual convention of the Ohio Valley Improvement Association was held at Portsmouth, Ohio, October 17 and 18. The object of this association is to secure such national improvements of the Ohio River that when they are completed they will give to the business interests of the Ohio River Valley cheap rates on the river, serving as a regulator of railroad rates for hundreds of miles of territory on either side of its banks. The improvement of the river is shown by the attendance at this convention not to be a strictly local matter.

Hon. J. E. Ransdell of Louisiana was present at the convention to give his assistance to the project. Mr. Ransdell is doing much to unify the country on all waterway improvements. He was one of the originators of the recent organization, the National Rivers and Harbors Congress, which is to meet at Washington December 6 and 7.

The opening address at the Portsmouth convention was made by Governor A. L. Harris of Ohio, who held that any improvement which is beneficial to a territory so great in extent, population, wealth and industrial activity as the Ohio Valley must necessarily benefit the whole country. He stated that the Ohio River system, with its tributary waterways, is second in importance only to the lake system. The Mayor of Pittsburgh, George Guthrie, addressed the convention, illustrating the importance to communities of adequate, continuous and moderate cost means of transportation, closing with an appeal for an enlightened, liberal and progressive policy of internal waterway improvement. William H. Kavanaugh, vice-president of the St. Louis Business Men's League, indorsed the position taken by Mr. Ransdell, and advocated a continuous and liberal appropriation to be expended in a careful, businesslike, judicious and effective manner. He said that St. Louis, although interested in the improvement of the upper Mississippi River, is ready at all times to assist in the improvement of the Ohio. He tendered an invitation to the members of the association to attend the convention of the Deep Waterways Association to be held at St. Louis, November 15 and 16.

Resolutions were adopted reaffirming as the sense of the association that the improvement of the Ohio River from Pittsburgh to Cairo should be such as to provide a 9-ft. stage at low water, further advocating that improvements of the river be made according to the report and recommendation of the United States engineers and approved by the Secretary of War, and that when the work is begun on a lock and dam it should be completed as expeditiously as possible. The resolutions further included a protest against the maintenance of narrow channel spans across navigable rivers, and urged Congress to enact such laws as will effectually control the rebuilding of bridges to the end that in reconstructed bridges the obstructive features shall be eliminated.

Col. John L. Vance of Columbus, Ohio, for many years president of the Ohio Valley Association, was re-elected. The list of vice-presidents includes business men located at Pittsburgh, Wheeling, Huntington, Parkersburg, Cincinnati, Ironton, Portsmouth, Steubenville, Louisville, Catlettsburg, Paducah and points in Indiana and Illinois.

The Trans-Alaska-Siberian Railway Company has been incorporated with a capital stock of $6,000,000 by Loicq De Lobel of Paris; J. A. L. Waddell of Kansas City, Mo.; John J. Healy of Seattle, Wash., and William H. Black of New York, to construct an international railroad under Behring Strait.

New Publications.

Clays: Their Occurrence, Properties and Uses. By Heinrich Ries, Ph.D. Cloth, 8vo; xvi + 490 pages; 65 figures, 44 plates. Publishers, John Wiley & Sons, New York. Price, $5 net.

The author, who is assistant professor of economic geology in Cornell University, has prepared this volume with special reference to the clays of the United States. His competence to write on this subject is established by his years of investigations in the science of geology and by the special attention he has given to the study of clay formations and clay products. The chemist is a factor more and more in the manufacture of the products of clay and the various clay working industries are now conducted on a far more scientific basis than at any time in their history. Dr. Ries, while recognizing that few mineral products have been more extensively treated in scientific and technical literature than clay, has prepared the present work in response to a demand for a comprehensive volume which should be of value to geologists, chemists and all others interested in clay and its applications. The book is excellently printed and illustrated, and with its thorough treatment and complete bibliography constitutes a monumental volume.

In the opening chapter the author treats of the origin of clay, introducing the classifications of well-known geologists. In Chapter 2 the chemical properties of clay are considered, and in Chapter 3 the physical properties of clay. Of particular interest is Chapter 4, under the title, "Kinds of Clay." Here the author introduces matter relating to the manufacture of clay products which might well have received treatment in a separate chapter. In the same connection the different methods of mining are considered. The lay reader may well be surprised at the diversity of uses of clay, either in its raw or burnt condition, the author classifying them under domestic, structural, refractory, engineering, hygienic, decorative and minor uses. As one of the most ancient of arts, clay manufacture has been extensively treated on its historical side, but the illustrations and descriptions before us relate to manufacturing plants of modern construction and of up to date equipment. The latter portion of the work is devoted to a detailed consideration of the distribution of clay in the United States, the various States being taken up in order. The arrangement of the subject matter under this general head is according to geologic formations. This the author considered permits of greatest uniformity in treatment. Statistics of production are given as reported by the United States Geological Survey and a statement of the value of clay products in the United States in 1904. Common brick head the list, with a value for that year of $51,768,558, being 39.5 per cent. of the total production. Fire brick, with a value of $11,167,972, constitute 8.5 per cent. of the total production.

Dr. Ries' book is so admirable in its comprehensiveness and so authoritative in its statement, and withal so full of interest, that it is destined to have a much wider reading than is given to most works of its class.

Structural Engineering Tables. By Edward Godfrey, structural engineer for Robert W. Hunt & Co. Size, 4 x 6½ in.; pages 200 + XIV. Flexible leather binding. Price, $2.50. Published by the author, Pittsburgh, Pa.

A structural engineer himself, the author has felt the need of a book of convenient size containing as many as possible of the tables commonly required by structural computers and draftsmen. It is frankly acknowledged that many of the tables are borrowed from other books, but by consent, as for example, those from the Carnegie Pocket Companion. The different rolled sections of which properties are given are those rolled by the Carnegie Steel Company. It has been endeavored in arranging the book to put the most used tables near the front, and so eliminate frequent reference to the index. So far as possible explanatory notes and examples illustrating the use of the tables are avoided, these being more properly in the province of text books and outside the intent of this work. Among the particularly useful tables given are those for quickly obtaining the weights and areas of angles, those for saving labor in the calculating of bending moments and weights of girders, those for interpolating for intermediate sections, and those for combining squares of ordinary numbers with squares of length, which avoids decimal quantities. Many valuable formulas and coefficients are also given, these being in many cases of a character not easily found in usable form in other works of reference, and many of the formulas are almost entirely new. The appendix is called the Manufacturers Section, and contains useful tables and data supplied by manufacturers concerning electric cranes, wire rope, and paint. This book is the first of a series the author intends to publish on practical mathematics, engineering calculations, designing, and kindred lines.

Elements of Gas Engine Design. By Sanford A. Moss, M. S., Ph. D. No. 121 of the Science Series, published by D. Van Nostrand Company, New York City. Size, 3¾ x 6 in.; pages, 197; price, 50c.

For the most part this book is a reprint of a set of notes accompanying a course of lectures delivered at Cornell University in 1902, when the author was an instructor in machine design. It also contains articles from technical periodicals, and numerous additions. Presupposing a familiarity on the part of the reader with the general features of the gas engine and its operation, this work aims to present in concise form all of the fundamental principles which a designer of gas engines needs to understand. Being primarily intended as a help to the designer, it does not attempt to cover mathematical or constructional details. Roughly the contents of the book may be summarized as follows: A general outline of the physics and chemistry of the gas engine; a discussion of gas engine fuels, with a table of relative power values of various fuels; a discussion of the action in a gas engine cylinder; the methods of finding the size of the cylinder for a given power; an outline of the more important principles of gas engine construction, and rational formulas for most parts of the gas engine, based on American practice.

Standard Telephone Wiring, for Common Battery and Magneto Systems. By James F. Fairman. Flexible leather binding. Size, 4½ x 6¾ in.; pages, 91; price, $1. Publisher: McGraw Publishing Company, New York.

This is a handbook for telephone men, containing diagrams of circuits for straight lines, party lines, plans, substations, private lines and intercommunicating systems, with a brief description of the apparatus used and rules of the fire underwriters. It gives a description of the action of the telephone receiver and transmitter, and plain and simple instructions for connecting different types of apparatus to both common battery and magneto systems. Carefully lettered diagrams are used to make clear all connections.

The Montreal Rolling Mills Company, Montreal, Canada, has just completed and put in operation a modern butt weld tube mill. The welding furnace, which is of the most modern type, was erected by Alex Laughlin & Co., engineers, Lewis Building, Pittsburgh. The machinery, draw bench, rolls, carrier, cooling table, &c., were supplied by the United Engineering & Foundry Company, Pittsburgh. All the equipment is electrically driven. The pipe mill proper has an area of 14,400 sq. ft., the screwing building is 72 x 162 ft., the galvanizing mill and storage building is 60 x 225 ft. and the crane runway for skelp and coal storage is 44 x 288 ft. The new mill is situated on the Lachine Canal, so that shipments can be made by boat, while the plant also has direct connections with the Grand Trunk and Canadian Pacific railroads. W. H. Creahan, formerly of the Youngstown Sheet & Tube Company, Youngstown, Ohio, is superintendent of this new pipe mill.

The Central Supply Association Visits the Youngstown Sheet & Tube Company's Plant.

The invitation of the Youngstown Sheet & Tube Company to members of the Central Supply Association in convention at Cleveland, Ohio, on October 23-25, to visit its large plant at Youngstown, Ohio, was very generally accepted, about 125 members availing themselves of the opportunity. A special train over the Erie Railroad was chartered by the company to convey its guests from Cleveland to Youngstown. The train left Cleveland on Friday morning at 10.30 and consisted of a dining car and two parlor cars. The comfort of the visitors was looked after by George E. Day, secretary and general sales agent, and W. E. Manning, assistant sales agent. A luncheon was served on the train. Invitations had also been extended to a number of Pittsburgh friends and customers of the company and they went from Pittsburgh to Youngstown on a special car, leaving Pittsburgh at 9.45 a.m. on the same day. The Pittsburgh delegation was in charge of E. S. Rooney, manager of the Pittsburgh office of the company, and upon arriving at Youngstown was taken to the Youngstown Club for luncheon. The two parties were then combined and in charge of the Youngstown Sheet & Tube Company officials were taken over its immense plant.

This company has just completed the building of a splendidly equipped Bessemer steel plant and blooming, billet, sheet and bar mills, which were fully described in *The Iron Age* of August 2. The new plant was thoroughly inspected and the visitors were then taken to the finishing departments, comprising plate, skelp, sheet, tube and pipe mills. The party spent the entire afternoon in going over the plant and was impressed with its size and with the modern facilities of the company for the manufacture of steel billets, sheet and tin bars, sheets, pipe up to 12 in. in diameter, skelp and tubes. The entire party was then taken to the Youngstown Club, where a banquet was served. Impromptu addresses were made by Jas. A. Campbell, president of the Youngstown Sheet & Tube Company; Geo. E. Day, secretary; Paul Blatchford, president of the Central Supply Association; Charles E. Pope, president of the Pope Tin Plate Company, Pittsburgh; J. M. Young of the Fort Pitt Supply Company; Robert A. Walker of *The Iron Age*, and others. The occasion was thoroughly enjoyed by all those present, and will no doubt serve to cement the friendship existing between the Youngstown Sheet & Tube Company and its friends in the Central Supply Association and others. The company extends an invitation to its customers and friends to visit its plant at any convenient time and they will be accorded all the courtesies that the officials of the company can show them.

Naval Architects and Marine Engineers' Meeting.

The fourteenth general meeting of the Society of Naval Architects and Marine Engineers will take place in New York City, Thursday and Friday, November 22 and 23, 1906. The meetings will be held in the auditorium of the American Society of Mechanical Engineers' headquarters, at 12 West Thirty-first street, and the following papers will be presented: "A Fireproof Ferryboat," by F. L. Du Bosque; "Construction of a Fireproof Excursion Steamer," by William Gatewood; "Speed and Performance of Albany Day Line Steamer New York," by Prof. J. E. Denton; "Personal Impressions of Model Towing Stations Abroad," by Prof. C. H. Peabody; "The Experimental Tank of the University of Michigan," by Prof. H. C. Sadler; "Model Basin Cleanings," by Naval Constructor D. W. Taylor, U. S. N.; "Comparison of the Durand and Curtis & Hewins Papers on Propeller Experiments of 1905," by Col. E. A. Stevens; "A Modern Fleet," by Capt. E. B. Barry, U. S. N.; "Recent Developments in Armor and Armament," by John F. Meigs; "The Development of Warship Design," by Naval Constructor R. H. Robinson, U. S. N.; "Development of Submarines," by Lawrence Y. Spear; "The Effect of Universal Rule on Yacht Design," by Martin C. Erismann; "The Gasoline Engine," by Arthur T. Chester; "Two Timber Dry Docks and Their Pumping Plant," by F. P. Phalen and G. L. Smith, and "A New Sea Anchor for Coaling at Sea," by Spencer Miller. A banquet will be held at Delmonico's at 7 p.m., Friday.

Annual Conference of Jones & Laughlin Steel Company's Selling Agents.

The annual conference of the selling agents from the the sales offices of the Jones & Laughlin Steel Company, Pittsburgh, was held in that city October 25, 26 and 27. The first day was given over to the inspection of the properties of the company in Pittsburgh, these consisting of the Soho blast furnace and plate mills, the five Eliza furnaces and coke ovens, the Monongahela connecting railroad and the Bessemer and open hearth steel plants and finishing mills on the South Side, Pittsburgh. On the evening of that day a theater party was given at the Nixon Theater. Friday was devoted to a conference between the selling agents and the heads of departments in the general offices and at the mills. Trade conditions, policies and other matters of interest were fully discussed. On Friday evening a banquet was tendered the selling agents at the Pittsburgh Club, at which impromptu addresses were made by B. F. Jones, president; W. L. King, vice-president; Robert Geddis, Roland Gerry, and also by a number of the agents.

It is the custom of the Jones & Laughlin Steel Company to have its various selling agents meet in Pittsburgh once a year, to visit the works and talk over business matters, and the conference this year is regarded as being probably the most pleasant and profitable one ever held. Among the agents who attended this conference were D. M. Barker and W. B. Worden of the Chicago house; F. A. Goodrich, St. Louis; F. H. Holt, Detroit; Boyden Kinsey, Cincinnati; A. F. Hollaway, New York City; F. M. Campbell, Philadelphia; A. B. Marble, Boston; G. C. Beals, Buffalo, and W. F. Bonnell, Cleveland.

The Jones & Laughlin Steel Company's New Works.

The Jones & Laughlin Steel Company, Pittsburgh, has secured in the past two years about 800 acres of very desirable manufacturing property on the line of the Pittsburgh & Lake Erie Railroad, about 20 miles from Pittsburgh, and which has a frontage on the Ohio River. The property was secured to allow the company to enlarge its capacity for the manufacture of pig iron, steel and finished materials, there not being sufficient ground available for this new plant at its American Iron and Steel Works on the South Side, Pittsburgh. Definite plans have been made for the building of four blast furnaces of about 500 tons daily capacity each, six Talbot open hearth furnaces of about 200 tons daily capacity each, a large blooming mill and a sufficient number of beehive coke ovens to furnish coke for the four blast furnaces. It is probable that additional finishing mills will also be erected by the company on this property, but plans for these have not yet been prepared.

During the week ending October 13 the Carnegie Steel Company broke all weekly records at its Sharon and South Sharon Works. The three blast furnaces produced 9795 tons, against the record of 9654 tons made in March. In one day No. 2 blast furnace made 522 tons of basic iron, against 496 tons, its best previous run. The open hearth furnaces made 12,060 tons, the best previous record being 12,019 tons. The universal plate mills produced 3657 tons, against 3496 tons made last March. The angle mill of the North Works turned out 3454 tons in one week, against 3409 made the week ending April 6 last. In the week ending October 27 the open hearth furnaces made another new record, turning out 12,114 tons.

The Steel Corporation's Quarterly Statement.

The United States Steel Corporation has issued its statement of earnings for the quarter ending September 30, 1906. It compares as follows with the corresponding quarter of the previous year:

	1906.	1905.
July net earnings	$12,242,098	$9,035,168
August net earnings	13,158,860	10,986,901
September net earnings	12,713,666	11,218,513
Total after deducting each month the expenditures for ordinary repairs, renewals and maintenance of plants, employees' bonus funds and interest on bonds and fixed charges of subsidiary companies	$38,114,624	$31,240,582
Less appropriations for the following purposes:		
Sinking funds on bonds of subsidiary companies	$578,053	535,135
Depreciation and reserve funds (regular provisions)	6,055,859	5,558,781
Special improvement and replacement funds	1,000,000	1,232,172
	7,633,912	$7,326,088
Balance of net earnings	$30,480,712	$23,914,494
Deduct interest for the quarter on U. S. Steel Corporation bonds outstanding	$5,691,521	5,745,696
Sinking funds for the quarter on U. S. Steel Corporation bonds:		
Installments	1,012,500	1,012,500
Interest on bonds in sinking funds	232,942	178,766
		$1,191,266
	6,936,963	6,936,962
Balance	$23,543,749	$16,977,532
Dividends for the quarter on stocks of the United States Steel Corporation:		
Preferred, 1¾ per cent., payable November 30	$6,304,919	6,304,919
Common, ½ per cent., payable December 31	2,541,512	8,846,431	.....
Surplus for the quarter	$14,697,318	$10,672,613
Less appropriated from surplus for the following purposes:		
On account of expenditures made and to be made on authorized appropriations for additional property, construction and discharge of capital obligations	11,000,000	4,000,000
Specifically set aside for contemplated appropriations and expenditures	.....	2,500,000
Balance of surplus for the quarter.	$3,697,318	$4,172,613
Unfilled orders on hand were as follows:		
September 30, tons	7,936,884	5,865,377

The net earnings for the quarter ending June 30 were $40,125,033. No dividend was then declared on the common stock and the special appropriation was $13,000,000, leaving for that quarter a surplus of $5,231,106. Unfilled orders, June 30, were 6,809,589 tons; March 31, 7,018,712 tons; December 31, 1905, 7,605,086 tons.

Reports in the daily press that the Carnegie Steel Company is considering the advisability of dismantling its armor plate plant at the Homestead Works are wholly unauthorized and untrue. Orders for armor plate from the Government have been rather light for some time, but the Carnegie Steel Company is taking some nice orders for safe deposit vaults for bank buildings. Among orders recently secured are bank vaults for the new buildings of the Union National Bank and the Commonwealth Real Estate Trust Company in Pittsburgh, the Cleveland Trust Company in Cleveland, the Commercial National Bank in Chicago and a large bank in Detroit.

A New Idea in Foundry Riddles.—The Rockwell is the name of a new riddle which has been placed on the market by the S. Obermayer Company, with factories at Cincinnati, Chicago and Pittsburgh. This riddle is claimed to be much stronger and to have greater wearing qualities than any riddle heretofore placed before the foundry trade. Its main feature is that where the rims and liners lap a strip of galvanized iron is bound securely over them, which prevents these joints catching and thus breaking when coming in contact with other objects. A patent has been appalied for.

OBITUARY.

JOHN STUBER, Cleveland, Ohio, a prominent foundryman, died October 14, aged 67 years. He was born in Germany, where he learned the molder's trade in the Government works. Immediately on his arrival in this country in 1866 he settled in Cleveland, and shortly afterward was made superintendent of the Chamberlin Foundry. He was one of the organizers of the Standard Foundry & Mfg. Company and held the position of superintendent until about 10 years ago, when he severed his connection with it to become the superintendent of the Ohio Foundry Company, holding that position until his death. He leaves a widow, three daughters and six sons.

LEWIS G. JENKS, recently appointed superintendent of the ore properties of the Republic Iron & Steel Company on the Mesaba range, died suddenly last week from heart failure. He was a native of Indiana and had been connected with the company for a number of years as head bookkeeper and cashier.

PERSONAL.

N. V. F. Wilson has resigned as general manager of the Portsmouth Steel Company, Portsmouth, Ohio. He was presented with a gold watch by the employees.

D. J. Bole has been appointed receiver for the Burns Uniform Steel & Metallic Company, Lewis Building, Pittsburgh, with works at Latrobe, Pa.

Andrew C. Campbell of the E. J. Manville Machine Company, Waterbury, Conn., is in Europe on a business trip for the company.

Howard E. Adt of the Geometric Tool Company, New Haven, Conn., has started for Europe, where he will combine business with the pleasure of travel.

L. F. Beers has taken charge of the Detroit office of the Buffalo Forge Company, succeeding H. M. Brightman, who is now connected with the Terry Bending Engineering & Construction Company, Grand Rapids, Mich.

Frank Dickerson, New York, district sales agent of the American Sheet & Tin Plate Company, will sail November 3 on the Cretic for a short trip through southern Europe. He will be accompanied by his family.

The annual meeting of the district managers of the Westinghouse Electric Mfg. Company was held at the offices of the company in East Pittsburgh last week. The first session was held on Monday, when addresses were made by E. M. Herr, first vice-president, who discussed the general situation, while commercial conditions were talked of by L. A. Osborne, second vice-president. Alexander Taylor, manager of works, talked on manufacturing conditions. Among those who presented addresses during the sessions were C. S. Cook, manager of the railroad and lighting departments; S. L. Nicholson, manager of the industrial and power department; C. B. Humphrey, of the detail and supply department; Walter Cary, general manager of the Sawyer-Man Electric Company, and A. H. Masters, sales department recorder. The meetings were concluded on Friday evening, October 26, with a banquet.

The famous Royal Gorge, near Cañon City, Col., is to be spanned by a bridge used in connection with an interurban electric railway system in Fremont County. The bridge will be 2800 ft. above the hanging bridge of the Denver & Rio Grande Railroad, at the bottom of the cañon.

Building materials for the reconstruction of Valparaiso will probably be exempted from import duty. Such a proposal is before the Chilean Government.

The American Demand for British Iron.

The recent appearance of a considerable American demand for Cleveland pig iron has been the feature of the British iron trade in October. It is worthy of note that in the same month two years previous the speculation in Cleveland warrants that ended so disastrously was started, on the expectation that the United States would soon require large amounts of Cleveland iron. The present purchases for American account are the first steps toward any realization of the hopes entertained by the leaders in the gamble of 1904 and the early months of 1905. Even now exaggerated reports are in circulation on the other side. It is represented, for example, that American iron firms practically control the situation in Cleveland warrants. They are credited with buying liberally toward the end of the spring months, when the market price stood at 50s. a ton.

While it is known that some foundry interests in the United States bought warrants at the time referred to, such purchases were made to protect foreign sales, particularly cast iron pipe, the intention being either to bring over the iron represented by these warrants and get the duty rebate on the finished product, or to sell the warrants later and buy domestic iron if home prices made the procedure more profitable. With stocks of No. 3 Cleveland iron in Connal's stores at Middlesbrough at 571,850 tons on October 18, it is wide of the mark to credit American buyers with control of the situation, particularly as the time at which they are alleged to have made large purchases through London and Glasgow bankers and brokers was a time of uncertainty and of low prices in the American iron market. It will be recalled that the large sales of Southern iron at $13, Birmingham, were made about the middle of June.

A Middlesbrough, Eng., market report of October 18 says: "It is reported that the Americans have been buying Cleveland warrants pretty freely, but it has not been ascertained whether these have been purchased on speculative account or are really wanted for consumptive purposes and will be taken out. During the last few days, however, a tolerably large quantity in the aggregate of Cleveland pig iron has been bought on American account —it is estimated at 40,000 tons—and as the orders have not been sent direct to the producers it is believed that they have been given to London and Glasgow merchants in the first instance, and it is thought they will draw largely on the public warrant stores for supplies. Steamers have already been chartered to convey four cargoes, and one—the Black Prince—has taken in her cargo of warrant iron for Philadelphia, the freight for which is 5s. 9d. per ton, a rather easy figure, and the cost of No. 3 Cleveland iron delivered there is at present about 79s. Makers here have only very small stocks, and cannot well deliver a large quantity on short notice, and the Cleveland iron wanted for America is required quickly."

The price of Cleveland iron from makers has been advancing under American demand. On October 18 No. 3 foundry was sold by makers at 58s., Middlesbrough, and at the same time Cleveland warrants were 55s. On Tuesday, October 30, Cleveland warrants had advanced to 58s. Prices are higher than at any time since November, 1900, and as German and American demand continues further advances are looked for.

The Buffalo & Susquehanna Iron Company.

The Buffalo & Susquehanna Iron Company, Buffalo, N. Y., has just placed a contract with the Brown Hoisting Machinery Company, Cleveland, for two Brown bridges similar to the four ore unloading bridges now in service at the company's furnace yard dock. The bridges will have a span of 223 ft., with an overhang at each end permitting of 50 ft. trolley travel over the vessel and 33 ft. travel over the ore bins. Each bridge is equipped with man trolley and a 5-ton Brown bucket, and the unloading capacity of each will be 300 tons an hour. The Buffalo & Susquehanna Iron Company has practically finished ore shipments for the season from its mines on the Menominee and Mesaba ranges. The new bridges will be put in operation in the season of 1907. The two furnaces of the company at South Buffalo are making about 600 tons a day of foundry iron, which is being shipped as soon as made, no accumulation of iron being possible under present conditions. An ample supply of coke is obtained from the plants of the identified Cascade Coal & Coke Company at Sykesville and Tyler, Pa. The former consists of 200 ovens, while at Tyler there are 400 ovens. Satisfactory experience is reported at the Buffalo & Susquehanna furnaces with the use of the Kennedy closed top.

Electric Cleaning of Metal Articles.

In a paper before the Faraday Society H. S. Coleman describes the successful use of the electric current in cleaning iron and brass articles preparatory to nickel plating. Hand scouring was not rapid enough to keep the plating vats fully loaded. The current is supplied from the plating dynamo. The plant is described as follows:

There is a wrought iron tank containing the cleaning solution. Over each end is erected a wooden structure, clear of the tank, to support the rods on which the work hangs. Along the top of each support is a flat copper strip, which is connected to the cable by means of a stud. The rods are made of hard drawn copper. These make surface contact only, owing to the variety of articles to be cleaned. There is a resistance board and change-over switch in the circuit. In the first stage of the process the iron tank is used as the anode, and the work as the cathode. A voltmeter is connected across the terminals of the bath for recording the difference of pressure, the current being recorded on the ammeter placed in the main circuit from the dynamo. The cleaning bath is made up of equal quantities of brown Montreal potash and sodium hydrate dissolved in water and kept boiling, specific gravity at 18 degrees.

The work, after wiring up in the usual way, is distributed along the copper rods in small bunches. The current is now switched on and adjusted until a difference of pressure of 2½ volts is recorded on the voltmeter. Immediately the surface of the work begins to change color; this takes from 5 to 10 min. The current is then reversed for a short time, usually 30 to 40 sec., until the surface is clear and bright. It is then switched off, and if the work is still dirty the operation is repeated. It is then thoroughly swilled in clean, cold water, passed through suitable dipping solutions, electro coppered, passed through clean, cold water again, and transferred to the plating bath.

Cleaning by this method is due to an electrolytic and not simply a chemical change. Electrolysis takes place and minute quantities of metallic sodium appear around the cathodes and occasionally take fire. The grease, which consists chiefly of tallow, is saponified and remains in solution. The lighter dirt is thrown upon the surface of the bath and may be skimmed off, the remainder, consisting of very fine emery, falling to the bottom of the tank.

In addition to the saving of labor and materials the advantages of the method are thus stated: The work is cleaned in one-third of the time occupied by the older method of scouring by hand. It is all wired up ready for plating, and the surface is not touched again by the hand until it is unwired after plating. This not only prevents a certain amount of stripping, but also saves the considerable time which would be occupied in wiring up again, after scouring by hand. The work is rendered chemically clean, due to the action of the current working out all grease and dirt from parts where it is impossible to scour with a brush. Time is saved in filling the vats, thus giving an increased output.

Steel rail exports from Great Britain in September were 43,506 tons, as compared with 45,181 tons in September, 1905, and 64,945 tons in September, 1904. The falling off is attributed to a check in the Argentine demand, which was only 5651 tons in September, this year, while it was 9692 tons and 22,279 tons, respectively, in the corresponding months of the two preceding years.

NEWS OF THE WORKS.

Iron and Steel.

Among those interested in the project for a steel plant at Bessemer, Ala., are G. P. Martin and Lee Moody of Bessemer, H. L. Badham, president, and James Bowron, vice-president, of the Bessemer Coal, Iron & Land Company. G. H. Stevenson, president of the Board of Trade of Bessemer, Ala., has also taken an active interest in the proposed steel company, which, it is stated, will employ a new process.

The blast furnace of the Franklin Iron Mfg. Company at Franklin Springs, N. Y., was blown out on October 16. It is expected that repairs will be completed so that the furnace can be blown in by November 26.

The new blast furnace the Lackawanna Steel Company is building at South Buffalo, N. Y., will be 85 ft. high and will have a hearth diameter of 15 ft. It is expected that the Kennedy closed top will be adopted for this furnace. Construction work is proceeding rapidly, and it is the intention to have the furnace ready to blow in in six months.

The Shenandoah Steel Wire Company has its new wire mill under erection at South Buffalo, N. Y., on land separated from the plant of the Lackawanna Steel Company by the Hamburg turnpike, which runs along the east side of the Lackawanna company's land. W. W. Gibbs of New York, general manager of the company, is in Buffalo in charge of construction work.

The Seneca Iron & Steel Company has been incorporated at Buffalo, N. Y., with a capital stock of $300,000. The directors are Louis E. R. French, Nelson S. Hallett and Arthur R. Jenkins, Buffalo.

The Pennsylvania Steel Company is bringing to completion the work of constructing the 120 Semet-Solvay coke ovens at Steelton, Pa., for which an appropriation was made last year. It is expected they will be put in operation early in January.

Ensley Furnace No. 4 of the Tennessee Coal, Iron & Railroad Company has gone out of blast for rebuilding, a work that will probably require about six months. Meantime new stoves for the No. 3 furnace are being built, and that furnace will be the next of the group to undergo reconstruction.

The Thomas Construction Company, Niles, Ohio, is asking bids for the erection of a steel building, 50 x 600 ft., with span 60 x 200 ft.; also for the erection of two 50-ton open hearth furnaces, two soaking pits and a blooming mill with seven continuous stands, for the rolling of billets, sheet and tin bars.

General Machinery.

The Wolf Mfg. Company, Chambersburg, Pa., has received an order for equipment for two flour mills for Japan. Shipments are to be made this winter.

Robert L. Ellery, Portsmouth, N. H., is to establish a machine shop in a wing of the works of the Portsmouth Forge Company. He will manufacture dust-proof center and side bearings for steam and electric cars.

Practically no new machinery will be required by the Lake Shore Electric Railway Company, Cleveland, Ohio, for equipping its shops at Fremont, which were recently damaged by fire, as but little of the machinery was damaged beyond repair.

The contract for the new Brewster shops of the Wabash lines east of Toledo, to be built as a part of the Justus cut-off improvement between Orrville and Bolivar, Ohio, has been awarded to Westinghouse, Church, Kerr & Co. This firm built the large power house of the Wabash at First avenue and Water street, Pittsburgh.

Power Plant Equipment.

A. H. Shaw of the Shaw Lumber Company, Bath, Maine, has purchased the power plant of the Bucksport Light & Power Company, Bucksport, Maine. No definite plans have yet been made for installing new machinery and building a new dam, which will probably be of concrete.

The Watertown Engine Company has been incorporated at Watertown, N. Y., to manufacture engines, boilers and machinery. The directors are J. C. Knowlton, N. P. Wardwell and G. C. Sherman, Watertown.

The Orr & Sembower Company, Reading, Pa., has re-elected C. H. Sembower, president; J. H. Stetely, secretary, and W. H. Orr, treasurer and general manager. Over 5000 engines and boilers, special products of the company, were shipped in the fiscal year, including several foreign orders.

It is stated that a contract will soon be let by the Lake Superior Corporation for the reconstruction of its Michigan power plant and dam. The cost of improvements will be over $500,000.

The Pittsburgh Feed Water Heater Company, Pittsburgh, Pa., reports the following recent sales: Carnegie Steel Company, Carrie Furnace, 4000 hp.; J. G. Johnstone Limestone Company, New Castle, Pa., 300 hp.; Wm. B. Moses & Sons, Washington, D. C., 200 hp.; Frank N. Mann, Alderson, W. Va., 200 hp. The company will soon issue a new and handsome catalogue showing its open and closed types of heaters and also the horizontal type heater.

At a meeting of the stockholders of the Robb Engineering Company, Limited, Amherst, N. S., on October 23, the consolidation of that company with the Robb-Mumford Boiler Company, South Framingham, Mass., was effected, the former company to become the owner of the stock of the latter company. The new capitalization of the Robb Engineering Company will consist of $850,000 6 per cent. bonds, $425,000 7 per cent. preferred stock and $165,000 common stock, of which $1,255,200 has been issued. While D. W. Robb has been president of both companies they have been practically under the same management, but it is thought it will be more advantageous to operate both plants under one corporation.

The Rust Boiler Company, Pittsburgh, has broken ground for its new plant to be located at Midland, Pa. The first new building to be erected will be a drum shop which will measure 107 x 420 ft., and will be of steel construction. A structural shop, pipe shop and power plant will also be erected, plans for which are now being made. It is stated that all the machinery equipment has been purchased, and it is probable the company will build a foundry after the above departments have been completed.

Foundries.

The Red Jacket Mfg. Company, Davenport, Iowa, has let contract for the construction of a new building which will cost from $20,000 to $25,000, and which will double the capacity of its foundry in West Davenport. The building will be 80 x 200 ft., of the same construction as the present foundry, and when completed will give the company a daily melting capacity of from 25 to 30 tons of iron. A brass foundry will also be installed, and when this is in operation the company will be in a position to make both gray iron and brass castings, not only for its own use, but for outside parties also. The foundry will be equipped with a complete trolley system for handling the molten iron and for the transportation of castings to various parts of the building, and a large new cupola will be installed midway between the two foundries, with a capacity sufficient to melt iron for both. Among recent orders placed in connection with the improvements is one for a new Corliss engine, new boiler and a complete fan system.

The Chester Steel Casting Company, Chester, Pa., is building a steel and brick addition to its foundry, 50 x 100 ft.

Powell & Colne, 11 Broadway, New York, have closed contracts for the installation of the Tropenas converter steel process, for which they are agents, with the Penn Steel Casting & Machine Company, Chester, Pa., and the Duquesne Steel Foundry Company, Coraopolis, Pa.

The Dickson Car Wheel Company, Houston, Texas, will erect a new car wheel foundry with a capacity of 300 wheels daily. The foundry will have 16 floors of about 25 wheels each, which will permit four of the floors to be idle all the time. The contract for the foundry equipment has been awarded to the Whiting Foundry Equipment Company and will consist of its standard straight floor system, with overhead trolleys for handling the flasks, the hot metal and for carrying the wheels to the wheel trucks. Only one cupola will be used, it being of such capacity as to sufficiently supply all of the floors with molten metal as required when pouring off. A. W. Slocum, formerly superintendent of the Keystone Car Wheel Company, Pittsburgh, has been appointed manager of the plant.

The J. D. Smith Foundry Supply Company, Cleveland, Ohio, manufacturer of foundry facings, blacking and foundry supplies, has installed an engineering department which makes a specialty of designing foundries complete, including the buildings and equipment. The company prepared plans for a reinforced concrete fireproof building for the Langsenkamp-Wheeler Brass Works, Indianapolis, Ind., contract for the construction of which was let to the Carey Construction Company, Cleveland, Ohio. The company reports business far in excess of its capacity, the only difficulty being its inability to fill orders promptly.

The Chicago Malleable Castings Company, West Pullman, Ill., has awarded contracts for the erection of an additional foundry building, 75 x 265 ft., to be known as Foundry No. 5. This foundry is one of three additional units now under contemplation and will be ready for occupancy December 15. Provision has already been made for the melting furnaces, annealing ovens and other necessary equipment for a plant of this kind.

Bridges and Buildings.

Plans have been prepared by Ira J. Hedrick, consulting engineer, for a combined railroad and highway bridge to be built over the Missouri River at the foot of Walnut street in Kansas City, Mo., by the Kansas City, St. Joseph & Excelsior Springs Railway Company. The structure will be double tracked for both railroad and motor traffic and will provide two separate roadways for vehicles. The total cost of the structure will be $1,100,000.

The Decatur Bridge Company, Decatur, Ill., has the contract for a new bridge across the Sangamon River, between Platt and Macon counties, costing $7698.

Fires.

The fertilizer plant, 110 x 250 ft., of the Southern Sanitary Company at Fort Covington, Md., was destroyed by fire October 26. The loss is placed at $40.000

The building and machinery of the American Smokeless Powder Company, Acton, Mass., were destroyed by an explosion October 29. The loss was $10,000.

The mill and boiler house at the slate quarry of John Jones, Castleton, Vt., were recently burned with a loss of $8000.

Hardware.

The Heller Brothers' Company, Newark, N. J., is building a three-story brick addition 40 x 150 ft. to its file plant and a rolling mill 75 x 200 ft. to its steel plant. The company expects to have both buildings equipped with machinery early next year. These additions have become necessary to enable the company to make prompt shipments of its products.

The Leroy Stamping Company, Leroy, N. Y., has been incorporated under New York State laws to manufacture sheet metal stamped goods of various kinds. A new plant now under way will, it is expected, be in operation within three months. Electricity or natural gas will be used for motive power. The officers of the new company are, J. S. Carr, president; Philo J. Sperry, vice-president; John C. Ross, treasurer, and Geo. A. Hall, secretary and manager.

Business is so good and the outlook so favorable with the Griffin Mfg. Company, Erie, Pa., that it has decided to increase its output largely. A new building is in course of erection, and with its completion the floor space of the plant will be increased about one-third

The Simonds Mfg. Company, Fitchburg, Mass., manufacturer of saws, machine knives and files, is to build another addition to its works, to be 40 x 60 ft. and three stories. The building will take care of the increase in the company's hand saw and circular saw departments

Liveright Brothers, successors to Mayer & Co., file manufacturers, Philadelphia, Pa., are adding a number of tools to their equipment which will enable them to double the present capacity of the plant. This concern has in view the general enlargement of its works and is considering the removal of its plant from the present location. Every department of the plant is fully occupied and orders in hand, we are advised, are sufficient to keep them employed for months ahead.

Miscellaneous.

The Keystone Motor Car Company, Philadelphia, Pa., will build a new garage, 53 x 200 ft., of reinforced concrete construction, which it will equip for the storage and repairing of gasoline cars. The company has probably sufficient machinery to fully equip its repair department, but expects to buy heating and lighting apparatus.

The recent fire at the plant of the Metal Volatilization Company, Denver, Colo., only slightly injured the machinery. A new frame structure will be erected to take the place of the one that was burned.

The Niagara Rubber Company has been incorporated at Lockport, N. Y., with a capital of $500,000, and has purchased the Lock street shops of the Holly Mfg. Company, which will be remodeled and equipped with rubber mill machinery for the manufacture of automobile tires and tubes, mats and mattings and a general line of mechanical rubber goods. The Amazon Rubber Company, Jamestown, N. Y., has been consolidated with the new company, and the machinery will be removed from its plant in Jamestown to Lockport. J. B. Ross, Jamestown, is president; H. Gardiner Jackson, Lockport, vice-president; A. M. Cheney, Jamestown, treasurer, and George W. Quinlan, Buffalo, secretary.

The American Motor Truck Company, Lockport, N. Y., a subsidiary company of the American District Steam Company, has leased the Caledonia street portion of the plant, formerly occupied by the Holly Mfg. Company, in that city, and will fit and equip it for the manufacture of motor trucks.

The Heintz Gas Burner Company has been incorporated at Buffalo, N. Y., to manufacture the Heintz patent gas burners. The directors are Roscoe D. Baker, P. E. Wurst and B. B. Wurst.

The Petroleum Iron Works Company, which is to erect a large manufacturing plant at Sharon, Pa., has let contract for a large and modern office building, which will be erected at once at a cost of $20,000. It will be of brick and two stories. The company also has the plans drawn for its plant, the main building to be 100 x 600 ft., but owing to the scarcity of structural material it is not expected that the buildings can be completed before next spring. The plant will employ 400 men.

The Elbridge Motor & Tool Company, Elbridge, N. Y., recently incorporated with a capital stock of $25,000, has purchased the De Long Motor Company of Syracuse, and merged it with its plant which it formerly operated under the name of the Elbridge Tool & Machine Company. R. B. Sweet is president and treasurer; W. L. Robedee, vice-president, and G. E. De Long, secretary.

The Andrew B. Hendryx Company, New Haven, Conn., has more orders booked and is daily receiving more orders than ever before in its history. The company states that despite the doubling of lands, buildings and machinery within the past two years its increased output has not equaled the growth in its business.

The Pittsburgh White Metal Company, Pittsburgh, maker of Babbitt and antifriction linotype, stereotype and other metals, is doing the largest business in its history, with very bright prospects for the future. The company is considering the advisability of enlarging its works in New York, this, however, depending on whether a suitable site can be secured.

Driggs Seabury Ordnance Company, Sharon, Pa., has been awarded a contract for about $80,000 worth of limbers by the War Department. The limbers are to be used in the new 3-in. light batteries which will be furnished to the regular artillery.

The Niles Car & Mfg. Company, Niles, Ohio, has increased its caiptal stock from $300,000 to $500,000.

The Pickands-Magee Coke Company, Pittsburgh, has added another coal interest as a subsidiary company by forming the Ohio Central Mining Company. A charter was granted at Harrisburg on October 26. The company takes over the property of the James Coal Company, which consists of a large tract of land and one coal mine near Dell Roy, Ohio. The officers are: W. C. Magee, president; W. Y. Bygate, vice-president; Charles L. Doyle, secretary; Charles S. Bygate, treasurer. All the subsidiary companies of the Pickands-Magee Coke Company are operating under Pennsylvania charters. They are as follows: Pittsburgh & Somerset Coal Company, two operations; Fowler Coal Mining Company, one operation; Pittsburgh, Bessemer & Lake Erie Coal Mining Company, one operation, and the Ohio Central Mining Company, one operation. The company also handles the product of the Jacksonville Coal & Coke Company and the Star Coal Company. Its coal capacity is 2000 tons daily and it produces and ships 75 cars, or about 2000 tons of coke daily.

The Hydraulic Jack.

Albert H. Smith, writing to the Philadelphia *Public Ledger* of the life and services of the late Sir Richard Tangye, tells the following:

The story of his career seems more like a romance of American enterprise than the ordinary history of British success. When a poor boy working upon his father's rugged Cornish farm he had, as he was wont to say, the good fortune to break his arm. The surgeon who set it told his father that the lad would perhaps never have the full use of it again, and as he was undersized and lacked the robust health and vigorous strength required for the rough work of the farm it would be wise to give him an education that would open the way to some clerical and sedentary occupation. The advice was taken and Richard Tangye received such education as could be imparted in a small school in the remotest corner of England. For a while he taught school, but with his first earnings removed to Birmingham to engage in the kind of business for which his mechanical genius and expertness seemed to qualify him. The hydraulic jack, the invention of George and Richard Tangye, laid the substantial basis of the family fortune. When the Great Eastern was built it was found impossible to launch the gigantic vessel. The skill of the best engineers of England was exhausted in the futile effort. By a fortunate accident the launching committee entered the obscure little shop of "Tangye Brothers, Engineers," who confidently expressed their ability to perform the task. It was the beginning of their great success, and to-day the Cornwall Works covers several acres of land in the city of Birmingham and has thousands of men on the pay roll. It is a saying at the works, "We launched the Great Eastern, and she launched us."

More Extensions to the Vandergrift Works.—The American Sheet & Tin Plate Company, Pittsburgh, has decided to add eight more hot mills to the Vandergrift Works at Vandergrift, Pa., which will give this plant a total of 37 hot mills, making it by far the largest sheet mill plant in the country, a distinction, however, that it has enjoyed for some years. Upon looking over our records we find that the original Vandergrift Works were started in October, 1895, the plant containing at that time two trains, one of which had five hot mills and the other eight hot mills. The plant also had at this time only three 35-ton open hearth furnaces and nine galvanizing baths. When the additional eight mills shall have been added the Vandergrift Works will contain 37 hot mills, 10 open hearth furnaces and 20 galvanizing baths, which will give some idea of the size of the plant and its wonderful growth. The Vandergrift Works is regarded as the ideal sheet mill plant of the world.

The Iron and Metal Trades

In respect to Foundry Iron, demand has grown more urgent and inquiry for foreign Iron has increased. One of the unusual conditions resulting is the practical establishment of a uniform price of $25 for spot No. 2 Foundry Iron, both East and West, and in the Chicago market as high as $25.50 has been paid. Southern furnaces have advanced their prices for 1907 to $17.50, Birmingham, for No. 2, and in the Eastern market $22 at furnace is now quite general. That the necessities of buyers are growing more imperative is indicated by their willingness to pay what would have seemed a fortnight ago an improbable figure.

Bessemer Iron for 1907 has gone to $22, at Valley furnace; one buyer took 16,500 tons, delivery in the first half, paying $21, at furnace, for 10,000 tons, and $22 for a 5000-ton lot.

The fact that sellers of lake Ores will ask 75c. a ton advance for Bessemer grades for 1907 shipment and at least 50c. a ton advance for non-Bessemer, while coke for next year is selling at $3.10 and $3.15 at the oven, has stiffened the views of furnacemen as to prices for next year, and these have advanced all along the line. It is understood that as high as $1 a ton above the 1906 level has been obtained for lake Ores for 1907.

Imports have reached good proportions and the indications point to an increase in the movement. Considerably more than 50,000 tons is represented in the purchases of importing firms. Sales have been made at $23, tidewater, for No. 1 Scotch; $21.50 to $22 for No. 1 Middlesbrough, and $20.75 for No. 3. One fact bearing on the continuance of imports is that foreign Irons are now only $1 a ton below domestic Irons, while in the big movement of 1902 and 1903 the spread was $2 to $3. Since the first purchases for the United States early in October Middlesbrough warrants have advanced about $1 a ton, or from 54s. to 58s.

The largest Pig Iron transaction of the week is 30,000 tons of Malleable Bessemer at Chicago for a wheel foundry, deliveries covering the last nine months of 1907. In the East a large business has been done in low Phosphorus Iron, both foreign and domestic, at about $26, delivered at eastern Pennsylvania works.

The effect of the strain for larger outputs in October is more pronounced in steel making lines. In some cases ore and coke supplies have not been sufficient for record-breaking operations. The Steel Corporation finishes the month with a general breaking of its previous high records of March, this year. Up to October 27 its ingot production had reached 1,120,000 tons. In the same time the finished material output was 825,000 tons, as against 770,000 tons in an equal period in March. The Edgar Thomson rail mill had reached on October 27 the remarkable record of 79,000 tons.

Export business has kept up well. After several months of inability to take on new rail business for export, the mills are again booking orders. In the past week 30,000 tons was closed for the Guayaquil & Quito, the well-known Ecuador line, for shipment in the latter half of 1907 and the early months of 1908. Domestic rail business pending amounts to over 200,000 tons, including a large block for trolley lines.

Structural contracts of the week include 6000 tons for the Detroit tunnel and an increase of the Northern Pacific bridge order to 17,000 tons. Plate mills are receiving specifications from Steel car works at the rate of 2500 tons a day. On Structural Steel from 6 to 10 in. the mills find the pressure relaxing.

The expected advance in Tin Plates from $3.75 to $3.90 a box, Pittsburgh, became effective October 25. The Sheet mills have put up prices on the heels of an unprecedented demand, $1 a ton for Blue Annealed and $2 a ton for Black and Galvanized.

The report of a pending contract for 450 miles of 8-in. Line Pipe has put the Pipe trade on the *qui vive*.

At Pittsburgh a $3 advance in Bar Iron by leading producers is reported, or to 1.75c. The expected advance of $2 in Hoops, which was to be effective November 1, was not made.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Nov. 1, 1906.	Oct. 24, 1906.	Oct. 3, 1906.	Nov. 1, 1905.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	**$22.50**	$21.50	$21.00	$17.75
Foundry No. 2, Southern, Cincinnati	**20.50**	20.50	19.50	16.25
Foundry No. 2, Local, Chicago	**22.50**	22.00	20.50	17.75
Bessemer, Pittsburgh	**22.85**	20.85	19.85	17.35
Gray Forge, Pittsburgh	**20.85**	19.85	18.35	16.35
Lake Superior Charcoal, Chicago	**22.50**	22.00	21.00	18.50
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	**29.00**	28.00	28.00	26.00
Forging Billets, Pittsburgh	**36.00**	35.00	34.00	30.00
Open Hearth Billets, Phila.	**34.00**	32.00	32.00	28.00
Wire Rods, Pittsburgh	**35.00**	35.00	34.00	32.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
O. Steel Rails, Chicago	**18.50**	18.50	17.00	14.50
O. Steel Rails, Philadelphia	**18.75**	18.50	18.50	17.50
O. Iron Rails, Chicago	**26.50**	26.50	25.50	22.50
O. Iron Rails, Philadelphia	**25.50**	25.50	25.00	24.00
O. Car Wheels, Chicago	**21.50**	20.00	19.00	16.00
O. Car Wheels, Philadelphia	**21.50**	21.50	20.75	17.00
Heavy Steel Scrap, Pittsburgh	*16.75*	16.75	17.50	16.50
Heavy Steel Scrap, Chicago	**17.00**	16.50	16.50	15.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.83½	1.83½	1.83½	1.83½
Common Iron Bars, Chicago	1.71½	1.71½	1.71½	1.80
Common Iron Bars, Pittsburgh	**1.75**	1.60	1.60	1.80
Steel Bars, Tidewater, New York	1.64½	1.64½	1.64½	1.64½
Steel Bars, Pittsburgh	1.50	1.50	1.50	1.50
Tank Plates, Tidewater, New York	1.74½	1.74½	1.74½	1.74½
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.60
Beams, Tidewater, New York	1.84½	1.84½	1.84½	1.84½
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.84½	1.84½	1.84½	1.84½
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.57½	1.57½	1.57½	1.55
Skelp, Sheared Steel, Pittsburgh	1.60	1.60	1.60	1.65
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	**2.50**	2.40	2.40	2.15
Wire Nails, Pittsburgh	1.85	1.85	1.85	1.80
Cut Nails, Pittsburgh	1.90	1.90	1.90	1.65
Barb Wire, Galv., Pittsburgh	2.30	2.30	2.30	2.25
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	**22.25**	22.25	21.00	16.50
Spelter, St. Louis	**6.17½**	6.20	6.15	6.15
Lead, New York	*5.90*	5.90	6.00	5.20
Lead, St. Louis	**5.90**	5.90	5.80	5.15
Tin, New York	**42.25**	43.25	42.45	33.00
Antimony, Hallett, New York	**25.00**	25.00	24.00	12.50
Nickel, New York	45.00	45.00	45.00	40.00
Tin Plate, Domestic, Bessemer, 100 lb., New York	**$4.00**	$3.94	$3.94	$3.49

Chicago.

FISHER BUILDING, October 31, 1906.—(*By Telegraph.*)

The Pig Iron scarcity, which is growing more pronounced daily, has developed an active market for spot metal, and prices of both Northern and Southern grades have advanced $1.50 to $2 a ton. Delayed furnace shipments have practically depleted consumers' stocks, and in their anxiety to secure Iron buyers willingly pay the high prices asked. Northern grades of No. 2 Foundry on track have brought $25.50, and sales of Southern Iron in transit have been made at $25.40, Chicago. The apathy of consumers regarding next year's requirements is also being dispelled, a large Car Wheel interest having purchased 30,000 tons of Malleable Bessemer from local furnaces for delivery the last nine months of next year at close to $21, while 2000 tons of Charcoal for second quarter shipment was sold at $22.50, Chicago delivery. These are record prices on the present movement, and reflect the anxiety among consumers as to their future needs. In finished lines the anticipated advance on Sheets and Tin Plate was made October 25, Blue Annealed having been marked up $1 a ton; Box Annealed and Galvanized, $2; Tin Plate, $3, and Ternes, $2. Painted and Galvanized Corrugated sheets were likewise advanced 10c. and 5c. per square, respectively. The Northern Pacific has increased its order for bridge material with the American Bridge Company from 8000 to 17,000 tons, but contracts covering immediate operations are light. New orders are now included in the first rollings of the Structural mills, and the tonnage is already somewhat below the producing capacity. The October output of the mills of the Illinois Steel Company shows an increase in production as compared with September of over 25,000 tons, and the decline in the volume of specifications enabled the company to creep up on the entries on mill order books to the extent of

nearly 50,000 tons. The scarcity and high cost of Steel in the form of Billets, as well as Pig Iron, have resulted in an increased demand for Scrap, and desirable grades have again been sharply advanced. Western roads are making inquiry for Cast Iron Pipe for next year, an order for 2500 tons having already been placed.

Pig Iron.—The purchase of 30,000 tons of Malleable Bessemer for shipment the last nine months of 1907 is by far the most important transaction in the Iron market recorded during the present upward movement. The price, which is close to $21, is the highest that has yet been paid for this grade for next year's delivery, and other consumers are anxiously endeavoring to cover their future needs. Charcoal Iron for November-December shipment is selling at $23.50, while 2000 tons for the second quarter was placed at $1 less. No. 2 Foundry on track or in transit is held at $25 to $25.50, Chicago, and Southern Iron for the first quarter is quoted at $20.90 to $21.40 for April, May and June. The increased use of off grades of Foundry Iron and the high percentages of Scrap entering into foundry charges have developed an active demand for High Silicon Iron, 200 tons of 5 per cent. Southern having been sold this week at $26.90, Chicago, while Ohio Valley producers are naming almost prohibitive prices. We quote as follows, f.o.b. Chicago:

Lake Superior Charcoal	$22.50 to $23.50
Northern Coke Foundry, No. 1	23.00 to 23.50
Northern Coke Foundry, No. 2	22.50 to 23.00
Northern Coke Foundry, No. 3	22.00 to 22.50
Northern Scotch, No. 1	23.00 to 23.50
Ohio Strong Softeners, No. 1	22.80 to 23.30
Ohio Strong Softeners, No. 2	22.30 to 22.80
Southern Coke, No. 1	22.90 to 23.40
Southern Coke, No. 2	22.40 to 22.90
Southern Coke, No. 3	21.90 to 22.40
Southern Coke, No. 4	21.40 to 21.90
Southern Coke, No. 1 Soft	22.90 to 23.40
Southern Coke, No. 2 Soft	22.40 to 22.90
Southern Gray Forge	20.40 to 20.90
Southern Mottled	19.90 to 20.40
Malleable Bessemer	22.50 to 23.00
Standard Bessemer	22.30 to 22.80
Jackson Co. and Kentucky Silvery, 6 %	25.30 to 25.80
Jackson Co. and Kentucky Silvery, 8 %	27.30 to 27.80
Jackson Co. and Kentucky Silvery, 10 %	29.30 to 29.80

Coke.—Shipments of Foundry Coke from both the Virginia and Connellsville fields are being delayed on account of the car shortage, and dealers are securing $6.65 on track. For future delivery $3.75 Connellsville is asked, but consumers are not anxious to close on this basis. By-product Coke for November-December shipment is unchanged at $6.65 Chicago.

Old Materials.—Sales of Scrap by Western roads aggregating 8000 tons showed price advances ranging from 50 cents to $1 a ton on almost the entire list. There is an active demand for such material as Iron and Steel Axles and Rails, which can be used for rerolling purposes owing to the scarcity of Billets and Pig Iron, and these lines showed the biggest upward movement. Heavy purchases of Car Wheels at advanced prices are also reported, while Cast Scrap is moving freely. The Illinois Steel Company is not buying Heavy Melting Steel as reported, being self-contained in this respect. Quotations on gross tons, car lots, f.o.b. Chicago, are as follows:

Old Iron Rails	$26.50 to $27.00
Old Steel Rails, 4 ft. and over	20.25 to 20.75
Old Steel Rails, less than 4 ft.	18.50 to 19.00
Heavy Relaying Rails, subject to inspection, 50 lb. and under	28.50 to 29.00
Old Car Wheels	21.50 to 22.00
Heavy Melting Steel Scrap	17.00 to 17.50
Frogs, Switches and Guards	18.50 to 19.00
Mixed Steel	14.50 to 15.00

The following quotations are per net ton:

Iron Fish Plates	$22.00 to $22.50
Iron Car Axles	26.50 to 27.00
Steel Car Axles	22.50 to 23.00
No. 1 Railroad Wrought	17.50 to 18.00
No. 2 Railroad Wrought	16.50 to 17.00
Railway Springs	15.50 to 16.00
Locomotive Tires, smooth	16.00 to 16.50
No. 1 Dealers' Forge	13.50 to 14.00
Mixed Busheling	11.50 to 12.00
Iron Axle Turnings	11.00 to 11.50
Soft Steel Axle Turnings	11.00 to 11.50
Machine Shop Turnings	11.00 to 11.50
Cast Borings	9.00 to 9.50
Mixed Borings, &c	9.00 to 9.50
No. 1 Mill	10.50 to 11.00
No. 2 Mill	9.50 to 10.00
No. 1 Boilers, cut to Sheets and Rings	12.50 to 13.00
No. 1 Cast Scrap	16.50 to 17.00
Stove Plate and Light Cast Scrap	13.00 to 13.50
Railroad Malleable	16.00 to 16.50
Agricultural Malleable	15.00 to 15.50

Metals.—Sheet Zinc has advanced 15 cents per 100 lb., an advance which has been anticipated for some time. Copper and Tin remain strong and steady, and prices have not moved materially from last week's basis. We quote: Casting Copper, 23¾c. to 24¼c.; Lake, 24c. to 24½c., in car lots for prompt shipment; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 45¾c.; small lots, 46¼c. to 46½c.; Lead, Desilverized, 6.10c. to 6.20c., for 50-ton lots; Corroding, 6.80c. to 6.90c., for 50-ton lots; on car lots, 2¼c. per 100 lb. higher; Cookson's Antimony, 28½c., and other grades, 26½c. to 27½c.; Sheet Zinc is 7.90c. list, f.o.b. Lasalle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 18¾c.; Heavy Copper, 18¼c.; Copper Bottoms, 17¼c.; Copper Clips, 18c.; Red Brass, 18c.; Red Brass Borings, 16c.; Yellow Brass, 13¼c.; Yellow Brass Borings, 12¼c.; Light Brass, 9¼c.; Lead Pipe, 5.40c.; Tea Lead, 5c.; Zinc, 5c.; Pewter, No. 1, 26c.; Tin Foil, 32c.; Block Tin Pipe, 27½c.

(By Mail.)

Billets and Rods.—Steel transactions are limited almost entirely to carload lots of Forging Billets for immediate delivery, at prices ranging from $36 to $37, f.o.b. Chicago. Receipts are exceedingly scarce, and although deliveries are being made on existing contracts at $35, Chicago, small lots for early shipment are held at $37 to $38, equivalent to $34 and $35, Pittsburgh.

Rails and Track Supplies.—Specifications covering Rail shipments the remainder of the year are now in the hands of the mills and the indications are that a large tonnage will be carried over into next year. Specifications covering 1907 shipments are not expected until about the middle of December. Quotations are as follows: Angle Bars, accompanying Rail orders, 1906 delivery, 1.50c.; carload lots, 1.75c.; Spikes, 2.27½c. to 2.50c., according to delivery; Track Bolts, 2.65c. to 2.75c., base, Square Nuts, and 2.80c. to 2.90c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 30 to 45 lb. sections, $30 to $31; 25-lb., $32; 20-lb., $32; 16-lb., $34; 12-lb., $35, f.o.b. mill. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—Although the mills are well up on specifications and can include orders in first rollings, nevertheless there has been no accumulation of material on account of the lack of demand. The car shortage has resulted in the accumulation of a stock of approximately 10,000 tons at South Chicago, which hampers the finishing operations of this new mill, and unless the material is moved there is a possibility of the mill being shut down for a few days. The Northern Pacific order of 8000 tons placed with the American Bridge Company last week has since been increased to 16,000 tons, covering the company's bridge requirements for next year. A fair demand continues for material from stock, which is unchanged at 2.05c. to 2.10c. Mill quotations are unchanged, as follows: Beams and Channels, 3 to 15 in., inclusive, 1.86½c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.86½c.; larger than 6 in. on one or both legs, 1.96½c.; Beams, larger than 15 in., 1.96½c.; Zees, 3 in. and over, 1.86½c.; Tees, 3 in. and over, 1.91½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending and other shop work.

Plates.—The production of Sheared Plates at the South Works of the Illinois Steel Company in October has broken all previous records and will reach a total of over 16,000 tons. Early shipments of both Universal and Sheared sizes can be made by all of the Eastern mills. Prices are as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.76½c.; 3-16 in., 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Flange quality, in widths up to 100 in., 1.86½c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-in. and heavier, up to 72 in. wide, 2c. to 2.10c.; from 72 to 96 in. wide, 2.10c. to 2.20c.; 3-16 in., up to 60 in. wide, 2.10c. to 2.20c.; 72 in. wide, 2.35c. to 2.45c.; No. 8 up to 60 in. wide, 2.15c. to 2.25c.; Flange and Head quality, 0.25c. extra.

Sheets.—On Thursday, October 25, the American Sheet & Tin Plate Company announced an advance of $2 a ton on Box Annealed Black Sheets and Galvanized Sheets and $1 a ton on Blue Annealed. At the same time Tin Plate was advanced 15c. a box or $3 a ton and Terne Plates 10c. a box. Corrugated Painted Roofing was advanced 10c. per square to a base of $1.85, Pittsburgh, and Galvanized was marked up 5c. to $3.15, Pittsburgh. On account of the high cost of Sheet Bars all of the independent manufacturers have already followed the lead of the largest producer. Black and Galvanized Sheets from store have been marked up $2 a ton, and we revise quotations as follows: Blue Annealed, No. 10, 1.96½c.; No. 12, 2.01½c.; No. 14, 2.06½c.; No. 16, 2.16½c.; Box Annealed, Nos. 17 to 21, 2.51½c.; Nos. 22 to 24, 2.56½c.; Nos. 25 and 26, 2.61½c.; No. 27, 2.66½c.; No. 28, 2.76½c.; No. 29, 2.86½c.; No. 30, 2.96½c.; Galvanized Sheets, Nos. 10 to 14, 2.71½c.; Nos. 15 and 16, 2.91½c.; Nos. 17 to 21, 3.06½c.; Nos. 22 to 24, 3.21½c.; Nos. 25 and 26, 3.41½c.; No. 27, 3.61½c.; No. 28, 3.81½c.; No. 30, 4.31½c. Sheets from store, Blue Annealed, No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.70c.; Nos. 22 to 24, 2.75c.; No. 26, 2.80c.; No. 27, 2.85c.; No. 28, 2.95c.; No. 30, 3.35c.; Galvanized from store, Nos. 10 to 20, 3.20c. to 3.25c.; Nos. 22 to 24, 3.45c. to 3.50c.; No. 26, 3.55c. to 3.60c.; No. 27, 3.65c. to 3.85c.; No. 28, 4.00c.; No. 30, 4.55c. to 4.60c.

Bars.—While Steel Bar manufacturers are experiencing little difficulty in securing 1.60c., Pittsburgh, on Eastern business, no better than 1.50c. can be secured in this territory, notwithstanding the congested condition of the mills.

The Iron Bar market shows increased strength, and although 1.50c., Pittsburgh, or 1.66½c., Chicago, is quoted occasionally, the bulk of the tonnage is being booked at an advance of $1 to $2 a ton. Local distributers have advanced store prices on Hoops $1, while Steel Bars are quoted at 1.85c. to 2c. We quote as follows: Iron Bars, 1.71½c.; Steel Bars, 1.66½c. to 1.76½c., both half extras; Hoops, 2.06½c., extras as per Hoop card; Bands, 1.66½c., as per Steel card; Soft Steel Angles and Shapes, 1.66½c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 1.85c. to 2c.; Steel Bands, 1.85c. to 1.90c., half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—Notwithstanding the recent advance, there has been practically no decline in the demand, and the mills are unable to make early shipments on new orders. Specifications are now being sent the mills from 30 to 60 days before the material is required, as stocks generally throughout the West are very low. We revise discounts, car lots, Chicago, as follows: Black Steel Pipe, 77.35, on the base sizes, ¾ to 6 in., and Galvanized, 67.35. From store in small lots Chicago jobbers quote 74½ to 75 per cent. on Black Steel Pipe, ¾ to 6 in.

Boiler Tubes.—An early advance on Tubes is anticipated by the trade, in view of the higher prices that are now being quoted on Steel Pipe. All concessions on material from store have been withdrawn, and the market is exceedingly firm. Mill quotations are unchanged as follows, on base sizes 2¾ to 5 in., in carload lots: Steel Tubes, 68.35; Iron, 55.35; Seamless, 50.35; 2½-in. and smaller and lengths over 18 ft., and 2½-in. and lengths over 22 ft., 10 per cent. extra. Store prices are unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to 1¼ in.	40	35	42½
1¾ to 2¼ in.	50	35	35
2½ in.	52½	35	30
2¾ to 5 in.	60	47½	42½
6 in. and larger	50	35	..

Merchant Steel.—Specifications forwarded to mills during October were not quite as heavy as during the previous month, and the total accumulated undelivered tonnage on mill order books is somewhat less than 30 days ago. This, however, does not indicate a falling off in consumption, inasmuch as consumers to insure receipt of their material specified freely for their future needs. We quote: Planished or Smooth Finished Tire Steel, 1.86½c.; Iron Finish, up to 1½ x ½ in., 1.81½c.; Iron Finish, 1½ x ½ in. and larger, 1.66½c., base; Channels for solid rubber Tires, ¾ to 1 in., 2.16½c., and 1¼-in. and larger, 2.06½c.; Smooth Finished Machinery Steel, 1.91½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.96½c.; Cutter Shoe, 2.35c.; Toe Calk Steel, 2.21½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c., and still higher prices are asked on special grades. Shafting, 50 per cent. off in car lots and 45 per cent. in less than car lots, in base territory.

Cast Iron Pipe.—Western railroads are now beginning to make inquiry for their 1907 Water and Culvert Pipe requirements, the Northern Pacific having asked for quotations on 2500 tons of Culvert Pipe, while the Great Northern will shortly be in the market for a large tonnage to be used in water line extensions. Quotations are unchanged, as follows: Water Pipe, 4-in., $34; 6, 8, 10 and 12 in., $33; over 12-in., $32, with $1 extra for Gas Pipe.

Philadelphia.

REAL ESTATE TRUST BUILDING, October 30, 1906.

The Iron and Steel situation is about as difficult to size up as it is possible for it to be. The past week has brought new complications through the offerings of heavy tonnages of Foreign Iron, but so far this has had no effect on prices, which in fact average a trifle beyond last week's figures. But it is obvious that buying cannot continue on the present scale for an indefinite period. Much of the recent buying was to cover probable shortages in 1906, which many large consumers fear will extend well into 1907; hence considerable quantities were taken for the first quarter with a goodly proportion for the second quarter. Whether the somewhat expected heavy imports and the anticipated increase in the home production will affect prices or not remains to be seen. With such influences as now prevail a bad break might be looked for, but the old records appear to be disregarded, and it may be that the absorption will continue. Cost sheets will be hard on producers of Pig Iron, and if figured on that basis prices are not likely to recede very far, but when there is more Iron than needed for current requirements, cost sheets have no immediate influence as regards prices until the supply is cut down in proportion to daily requirements. The difficulty at the present time is that imports are coming in when prices are at the very highest figures reached for the past three or four years, so that they are really taking the cream of the trade. But we could probably stand all the imports we are likely to get, although if the domesic output should show the increase that is figured on, it would cause no surprise to see lower prices before the end of the year. Prices are measurably within sight of $25, and under any circumstances that is a high figure for Pig Iron. The influence of Imported Iron will be pretty well distributed along the entire seaboard from Baltimore to Boston, Philadelphia getting the bulk of the Middlesbrough shipments, Baltimore the Steel making Irons, and New York and Boston the Scotch Irons. This should relieve the pressure in New York and the New England States, as well as the Pennsylvania, New Jersey and Delaware Districts, as the shipments have been made with distinct reference to the grades required at each particular place. At present, however, prices show no weakness, all sales being made at the full prices of last week and in some cases at a slight advance.

Pig Iron.—Prices are quite as unsettled as they were a week ago. In some cases they are a trifle dearer, but there are also some indications that they are getting rather "toppy." Consumers have bought and bought and bought again, until there is apparently nothing left, but if all the Iron that has been bought can be taken in addition to the increased production, which is expected from our own furnaces, it will be one of the marvels of the age, without taking into account the very considerable tonnage which must now be taken from other countries. A great many miscalculations have been made in regard to business during 1906 (chiefly in underestimates), but strenuous efforts have been made to catch up, and it is now a serious question whether that point has not been reached. It is one thing to produce at the rate of 24,000,000 tons of Pig Iron at an average of $17 to $18 per ton, and 25,000,000 tons or more at $22 to $23 per ton, but the effect of such conditions will unquestionably be felt in due time, although buying continues on a surprisingly large scale, and as yet all offerings are taken at full prices. American spot Iron is scarce, but Scotch and English Irons can be had in fairly liberal quantities for November arrivals. There are four or five cargoes due to arrive this month and more in December, providing the markets continue favorable. Deliveries of domestic Irons are somewhat easier, although the shortage in Mill Irons is said to be worse than it has been for several months. The entire situation, however, is so complicated that almost anything might happen if the current of feeling should get twisted around. Prices are so variable that they can only be given on a wide range, depending upon the circumstances in each individual case. A greater variety of Irons has been sold than ever before, including English and Scotch as well as all grades of American. Low Phosphorus Iron has been rather heavily bought, mostly, however, for Western delivery, local buyers paying $26 to $26.50, delivered, for small lots, or $25.25 to $25.50, ex-ship, Baltimore. The general range for 1907 deliveries in eastern Pennsylvania and adjoining districts is about as follows, 1906 deliveries being 50c. to $1 per ton more:

No. 1 X Foundry	$23.50 to $24.00
No. 2 X Foundry	22.50 to 23.00
No. 2 Plain	21.50 to 22.25
Standard Gray Forge	19.75 to 20.50
Ordinary Gray Forge	18.50 to 19.50
Basic	20.25 to 20.50
Low Phosphorus	26.25 to 26.50
Malleable	22.00 to 23.00
Middlesbrough, on dock, No. 2 and No. 3	21.00 to 22.25
Scotch, on dock	22.50 to 23.00

Ferro Alloys.—There is more business doing, but without very much change in prices, although the feeling is easier for 1907 shipments. November and December deliveries of Ferro could be arranged at $78 to $80, and at $73 to $75 for the first half of 1907; Ferro Silicon, $98 to $102 for spot or December deliveries.

Steel.—The market is very strong, and for prompt deliveries buyers would be willing to pay extreme prices, $34 to $36 anyway, probably more in an emergency. Forging Billets are $38 to $40. Mills are crowded with work, and this year's deliveries are practically impossible on new orders.

Plates.—The same report as given for months past must again be given without change of character. Prices are entitled to go higher, but there is such an unwillingness to disturb things that they have been permitted to continue unchanged as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.73½	1.78½
Flange or Boiler Steel	1.83½	1.88½
Marine	2.13½	2.18½
Locomotive Firebox Steel	2.23½	2.28½

The above are base prices for ¼-in. and heavier. The following extras apply:

	Extra per 100 pounds.
3-16 in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—The market is very satisfactory, but there is no overcrowding and deliveries can be arranged almost as required—small orders in 30 days, others in 60 or 90 days, as the case may require. Prices are unchanged at 1.83½c. to 2c. for Beams, Channels or Angles.

Bars.—No great activity can be noted in Refined Bar Iron, although Steel is in good demand and difficult to get in

any reasonable time without paying the same price as for Bar Iron, although Steel is nominally 1.73½c., while Refined Iron commands 1.83½c. Prospects are quite favorable, but for the present there is no great pressure either for spot lots or forward deliveries. It should cause no surprise, however, to see a very sudden movement in the Bar trade, as it is somewhat out of line with the rest of the market.

Sheets.—There is a good demand and prices have advanced, and are now about as follows for mill shipments in carload lots and a tenth additional for small lots: No. 18 to 20, 2.60c.; Nos. 22 to 24, 2.70c.; Nos. 25 and 26, 2.80c.; No. 27, 2.90c., and No. 28, 3c.

Old Material.—The past week has developed heavy buying in Steel Scrap with some prospect that the movement will be of considerable importance the next two or three months. New York City and State are likely to be heavy buyers during the winter months, while one new and extensive plant near Philadelphia will also be a considerable factor. Bids and offers for deliveries in buyers' yards are about as follows:

Steel Crops	$18.75 to $19.50
No. 1 Steel Scrap	18.25 to 18.50
Low Phosphorus Scrap	22.50 to 23.00
Old Steel Axles	22.50 to 23.00
Old Iron Axles	31.00 to 31.50
Old Iron Rails	25.50 to 26.50
Old Car Wheels	21.50 to 22.50
Choice Scrap, R. R. No. 1 Wrought	22.00 to 22.50
Choice No. 1 Yard Scrap	19.00 to 20.00
Long and Short	18.50 to 18.75
Machinery Scrap	18.50 to 19.00
Wrought Iron Pipe	16.00 to 16.50
No. 1 Forge Fire Scrap	16.50 to 17.00
No. 2 Light Ordinary	11.50 to 12.00
Wrought Turnings	14.25 to 14.75
Axle Turnings, Choice Heavy	15.75 to 16.25
Stove Plate	13.50 to 14.00
Cast Borings	11.25 to 11.50
Grate Bars	13.50 to 14.00

Harry W. Ginsburg, trading as the Penn Iron & Metal Company, has opened offices and yards at Twenty-fifth street and Washington avenue, Philadelphia, for the purpose of buying and selling Scrap Iron, Steel and Metals. Mr. Ginsburg was formerly connected with the Girard Iron & Metal Company.

Pittsburgh.

PARK BUILDING, October 31, 1906.—(*By Telegraph.*)

Pig Iron.—The tendency of the market is steadily upward, and just when top prices will be reached is a question. The supply of spot Iron is very limited, and this is largely true of Iron for delivery over the first six months of next year. Consumers who have not covered ahead and are compelled to buy are now up against very high prices, and are having trouble to find Iron even at prevailing market prices. During the week a local consumer bought 16,500 tons of Standard Bessemer Iron for delivery over the first six months of next year, for which he paid $22, Valley furnace, for 5000 tons, and $21 for 10,000 tons, while the other 1500 tons went at a considerably lower price, the seller evidently not being posted on the actual market. It is not probable that any Bessemer Iron for delivery this year or through the first half of next year could be bought to-day at less than $22, Valley furnace. Basic is as scarce as Bessemer, and is being practically held at as high prices. We note a sale of 3000 tons of Basic for delivery in the first half of next year at $21, Valley furnace. Northern No. 2 Foundry is selling at $22 to $22.50, for delivery over the first half. We note a sale of a small tonnage of No. 2 Foundry for delivery over the first half at $22, Valley furnace. It is reported that some foreign Foundry is coming into this market for the Westinghouse Electric & Mfg. Company, at East Pittsburgh. Northern Forge Iron is now firm on the basis of $20 to $20.15, Valley furnace.

Steel.—It is almost impossible to get either Bessemer or Open Hearts Billets at any price. A sale is reported of 4000 tons or more of Bessemer Billets, sizes ranging from 1½ in. and larger, and carbons running 0.10 to 0.25, at $29 at mill, or practically $30, Pittsburgh. We are advised that ordinary 4 x 4 Bessemer Billets have been sold in large tonnages for delivery over the first six months of next year at $29, maker's mill. Open Hearth Billets are quoted at $31 to $32, and we note a sale of 2000 tons of 4 x 4 at $31.50, Pittsburgh.

(*By Mail.*)

The advance of $1 a ton on Blue Annealed Sheets and $2 a ton on Black and Galvanized and record breaking prices being paid for Pig Iron are the principal features of the week. The scarcity in spot Iron is growing more serious, and it looks very much as though consumers that have been caught short and have to buy will be forced to pay still higher prices. During the week Bessemer Iron for prompt delivery has sold at $23, Valley furnace, in small lots, and at $22 for shipment over first half of next year. Northern No. 2 Foundry for prompt delivery has sold at $23 and Northern Forge for prompt shipment at $20, Valley furnace. Bessemer and Open Hearth Billets are almost impossible to get, Bessemer Billets bringing $29 and higher and Open Hearth $31 to $31.50, Pittsburgh. New business in Finished Iron and Steel continues heavy, with the exception of the medium sizes of Beams and Channels, which have shown a slight falling off, and the mills could handle more tonnage at present on these sizes if they had it. Coke is scarce and is readily bringing $3 at oven or higher for prompt shipment. The whole market on raw materials indicates that prices will go higher, and the same is true on some lines of Finished Material. Iron Bars have been advanced during the week about $3 a ton and are now 1.75c. minimum, Pittsburgh.

Ferromanganese.—The market continues very strong and there is a good deal of inquiry. We quote 80 per cent. Ferro for forward delivery at $75 to $77.50, and $80 to $82.50 for prompt shipment.

Wire Rods.—The situation in Rods is getting tighter, and they can hardly be had at any price. Leading producers are using their entire output and the available supply is very limited. We quote Bessemer Rods at $35 and Open Hearth $36 to $37, Pittsburgh.

Muck Bar.—There is a heavy demand for Muck Bar, and like all other raw materials it is very hard to obtain for prompt delivery. The Republic Iron & Steel Company is the principal producer in this district, but has not sold any Muck Bar in the open market for six months or longer. The scarcity and high prices of Forge Iron have caused another sharp advance in prices of Muck Bar, and we quote best grades made from all Pig Iron at $34, and from part Scrap at $31 to $32, Pittsburgh.

Skelp.—There is a fair demand for Skelp, and buyers are specifying freely on contracts. Grooved Steel Skelp, 1.57½c. to 1.65c.; Sheared Steel Skelp, 1.60c. to 1.70c.; Grooved Iron Skelp, 1.65c. to 1.75c.; Sheared Iron Skelp, 1.80c. to 1.85c., Pittsburgh, these prices depending on widths and gauges.

Structural Material.—Conditions in the Structural trade have quieted down to some extent, as it is late in the season, and it is said that some large contracts that ordinarily would have been placed this year have been held back on account of doubt about the result of the elections and will likely go over until next year. On the medium sizes of Beams and Channels, ranging from 6 to 10 in., there hsa been an enormous increase in productive capacity the past year, the Jones & Laughlin Steel Company, Carnegie, and Lackawanna all having greatly increased their output, and just now there is not enough business to take care of this larger output, with the result that the mills could handle a greater tonnage in these sizes if they had it. Many small orders continue to come in, but no large contracts have been placed in this district the past week. Prices are firm, and we quote: Beams and Channels, up to 15-in., 1.70c.; over 15-in., 1.80c.; Angles, 3 x 2 x ¼ in. thick up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3-in. and larger, 1.70c.; Tees, 3-in. and larger, 1.75c. Under the Steel Bar card Angles, Channels and Tees under 3-in. are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Steel Rails.—The tonnage placed in Standard Sections the past week was rather light, the Carnegie Company having entered less than 10,000 tons. The demand for Light Rails continues large, the Carnegie Company having booked orders in the week about equal to its output. We quote Light Rails as follows: 20 to 45 lb. Sections, $31; 16-lb. Sections, $32, and 12-lb. Sections, $33, at mill. Standard Sections are $28, at mill.

Iron and Steel Bars.—The Republic Iron & Steel Company, Lockhart Iron & Steel Company and other local interests have advanced prices on Iron Bars to 1.75c. minimum, Pittsburgh, and we are advised that some carload orders have been placed at 1.80c. for reasonably prompt delivery. The demand continues very heavy and the mills seem to be getting further behind in deliveries. Western implement makers are specifying on contracts at an unprecedented rate and are taking an enormous tonnage. The Carnegie and the Jones & Laughlin Steel companies are still quoting 1.50c., half extras, on Steel Bars for indefinite delivery, but Crucible, Cambria and Republic are holding at 1.60c. minimum for shipment within four to six weeks from date of order. We quote Iron Bars at 1.75c. to 1.80c., Pittsburgh, and note that the lower price is absolute minimum.

Hoops and Bands.—It was expected that an advance of $2 a ton would be made in Hoops, effective November 1, but this has been annulled and the price will not be changed. New business is heavy and specifications are coming in freely on contracts, the mills being crowded to the limit with tonnage and are behind in deliveries. We quote: Steel Hoops, 1.90c., and Bands for all purposes at 1.50c., base, half extras, as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of $2 a ton being charged for less than carloads.

Plates.—The Jones & Laughlin Steel Company has secured the order for about 6000 tons of Plates, Steel Bars and Small Shapes, to be used in the tunnel under the Detroit River to be built by the Michigan Central Railroad. The general contractor for the work is the Butler Brothers Construction Company, New York City. A good deal of tonnage in Plates still remains to be placed by lake shipbuilders, and orders from this source in the next two or three months are expected to be unusually heavy. The Steel car interests continue to specify for an enormous tonnage of Plates, aggregating upward of 2500 tons a day. On Universal and Sheared Plates local mills are from four to eight weeks behind in deliveries, while the tonnage on books represents work for some months ahead. The continued shortage of Steel is restricting to some extent the Plate output of the mills. Prices are firm, but unchanged, and we quote: Tank Plates, ¼ in. thick, 6¼ in. up to 100 in. in width, 1.60c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than ¼-in. to and including 3-16-in. Plates on thin edge	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40

Shell Grade of Steel is abandoned.

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within 10 days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Sheets.—Effective October 25, one day too late to be announced in this report last week, the American Sheet & Tin Plate Company announced an advance of $1 a ton on Blue Annealed Sheets, $2 a ton on Black and Galvanized Sheets, 10c. per square on Black and Painted Roofing Sheets and 5c. per square on Galvanized Roofing Sheets. This advance had been generally expected by the trade for some weeks, and in fact some of the outside mills have been charging premiums of $1 to $2 a ton on Sheets for some little time. The tonnage of Sheets on the books of the mills at present is enormously heavy, and all the mills are from four to eight weeks or longer behind in deliveries. It is understood that heavy orders were booked by leading consumers prior to the advance in prices. Specifications on these contracts are large, and with the new business coming in will give the Sheet mills full work for some time to come. New prices, effective from October 25, are as follows: Blue Annealed Sheets, No. 10 gauge and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.35c.; Nos. 22 to 24, 2.40c.; Nos. 25 and 26, 2.45c.; No. 27, 2.50c.; No. 28, 2.60c.; No. 29, 2.75c.; No. 30, 2.85c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.55c.; Nos. 12 and 14, 2.65c.; Nos. 15 and 16, 2.75c.; Nos. 17 to 21, 2.90c.; Nos. 22 and 24, 3.05c.; Nos. 25 and 26, 3.25c.; No. 27, 3.45c.; No. 28, 3.65c.; No. 29, 3.90c., and No. 30, 4.15c. We quote No. 28 Gauge Painted Roofing Sheets at $1.85 per square, and Galvanized Roofing Sheets, No. 28 Gauge, $3.15 per square for 2-in. corrugations. These prices are for carload lots, jobbers charging the usual advances for small lots from store.

Tin Plate.—Effective October 25, the American Sheet & Tin Plate Company announced an advance of 15c. on 14 x 20 100-lb. Cokes, or to the basis of $3.90, and also advanced Black Plate $2 a ton. This advance had been anticipated by the trade for some time and was not a surprise. A very heavy tonnage in Tin Plate was booked prior to the advance, for delivery through the first quarter of 1907. Some business has been placed at the new prices, but the large consumers were pretty well covered. We quote $3.90 per base box, f.o.b. Pittsburgh, for 14 x 20 100-lb. Cokes, terms 30 days, less 2 per cent. off for cash in 10 days, on which price a rebate of 5c. a box is allowed for carload and larger lots.

Railroad Spikes.—The demand is unprecedented and none of the principal makers are able to make deliveries inside of two to three months. One leading mill has its entire output sold up until May 1 of next year. We quote on contracts for indefinite delivery $2.40 to $2.50, while for orders for shipment within three to four weeks $2.75 and higher is being readily paid.

Spelter.—The market is decidedly stronger and the demand is heavier than for some time. We have advanced prices and now quote prime grades of Western at 6.15c., St. Louis, equal to 6.27½c., Pittsburgh.

Pipes and Tubes.—Rumors are current in the Pipe market that the Guffey Oil Company is in the market for about 450 miles of 8-in. Line Pipe, but so far little that is definite is known about the order. The report has caused a good deal of stir, and if the business is placed it will no doubt have the effect of still further firming up prices on Pipe. The current demand for Merchant Pipe continues heavy, and the market is strong. Under date of October 23 the Youngstown Sheet & Tube Company, Youngstown, Ohio, maker of Iron Pipe from pure Puddled Iron, has issued a new card of discounts on Iron Pipe, which are given in the table below. The extreme discount on Merchant sizes of Steel Pipe is now 79 and 5 per cent. off to the large trade. The new official discounts, which became effective on October 12, but which are shaded one point or more to the large trade, are as follows:

Merchant Pipe.

	Jobbers, carloads. Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
	%	%	%	%
⅛ and ¼ in.	70	54	65.5	49.5
⅜ in.	72	58	65.5	57.5
½ in.	74	62	73.5	63.5
¾ to 6 in.	78	68	73.5	63.5
7 to 12 in.	73	58	69	54
Extra strong, plain ends:				
⅛ to ⅜ in.	63	51	58.5	46.5
½ to 4 in.	70	58	65.5	53.5
4½ to 8 in.	66	54	61.5	48.5
Double extra strong, plain ends:				
½ to 8 in.	59	48	53.5	42.5

Boiler Tubes.—We are advised that prices on Locomotive Tubes are firmer and that the demand is quite heavy. There is also a good inquiry for Merchant Tubes, and the mills are entering a good deal of tonnage. Prices continue to be shaded to some extent, depending on the order. Official discounts are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ in.	45	50
1¾ to 2¼ in.	45	62
2½ in.	50	64
2¾ to 5 in.	57	70
6 to 13 in.	45	62

Iron and Steel Scrap.—There is nothing of interest to note in the Scrap market. The demand is probably a little better, but prices are only fairly strong and a limited tonnage is moving. Prices quoted by dealers per gross ton f.o.b. Pittsburgh, are about as follows: Heavy Steel Melting Scrap, $16.75 to $17; No. 1 Wrought Scrap, $19.25 to $19.50; Old Steel Rails, short pieces for Open Hearth use, $16.75 to $17; Old Steel Rails, rerollers, $18.75 to $19; Bundled Sheet Scrap, $15.50 to $15.75; Cast Iron Borings, $10.25 to $10.50; Steel Axles, $22.50 to $23; Iron Axles, $28 to $28.50; Wrought Turnings, $12.75 to $13, and Old Car Wheels, $19.50 to $20.

Coke.—The heavy purchases of Coke by the Frick Coke Company referred to in this report last week have had the effect of causing a stiff advance in prices, strictly Connellsville Furnace Coke now being held at $3 minimum, with some sellers asking $3.15 to $3.25, at oven. Best grades of Connellsville 72-hr. Foundry Coke are selling at $3.75 to $4, at oven. Reports of a serious shortage in Coke are current, but are believed to be untrue. There is an enormous demand, and with a shortage of labor the production is not as heavy as it would be if labor was plentiful. It is evident, however, that Connellsville Furnace Coke for the first half of next year to consumers not already covered will be $3 a ton or higher.

The Pittsburgh Rubber & Leather Company has opened an office and storeroom at 915 Libert street, Pittsburgh.

Cincinnati.

FIFTH AND MAIN STS., October 31, 1906.—(*By Telegraph.*)

Pig Iron.—The situation as regards spot Iron grows worse as the year advances, and the available supply reported is very much restricted. It is said that a great many consumers are practically living from hand to mouth, having no supply to speak of on hand. Strenuous efforts are being resorted to by these concerns endeavoring to obtain Iron due on contract, often with indifferent success. Should anything occur that would tend to lessen the supply now coming forward in irregular lots it is a conceded fact that a large number would be compelled to shut down their plants. Prices are irregular and largely dependent upon circumstances, but fairly quotably from $20 to $21, Birmingham. It is said that several of the larger producers of the South have more or less tonnage on their yards, but are unable to satisfactorily move it on account of the shortage of cars, now so largely drawn into the cotton trade. Northern Foundry brands are practically unobtainable at any figure and prices are soaring. Gray Forge is in moderate demand, one inquiry coming from Pittsburgh territory for about 1000 tons for delivery in the first quarter of next year, with the available supply limited. Malleable, Bessemer and Charcoal Iron are in strong demand, with scanty

supply. One lot of high Silicon, 9 per cent., is reported sold at $27, at furnace. With the price of Ore advanced, it is anticipated that higher prices for Pig will obtain within the next month. One large melter in this territory is asking for prices for a considerable tonnage for delivery during the first half of next year. Freight rates from the Hanging Rock District to Cincinnati are $1.15, and from Birmingham, $3. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	$21.00 to $21.50
Southern Coke, No. 2	20.50 to 21.00
Southern Coke, No. 3	20.00 to 20.50
Southern Coke, No. 4	19.00 to 19.50
Southern Coke, No. 1 Soft	21.00 to 21.50
Southern Coke, No. 2 Soft	20.50 to 21.00
Southern Coke, Gray Forge	17.75 to 18.25
Southern Coke, Mottled	17.00 to 17.50
Ohio Silvery, 8 per cent	26.15
Lake Superior Coke, No. 1	22.65 to 23.65
Lake Superior Coke, No. 2	22.15 to 23.15
Lake Superior Coke, No. 3	21.65 to 22.65
Car Wheel Irons.	
Standard Southern Car Wheel	$26.50 to $27.00
Lake Superior Car Wheel	26.00 to 26.50

Coke.—The demand is strong and contracts covering the first half of next year are in evidence. Prices are stiff, with deliveries not altogether satisfactory. We quote the best brands of Connellsville and Virginia Foundry $3.75 to $4 f.o.b. ovens.

Finished Iron and Steel.—Market conditions continue strong and prices are firm. There is a rumor that Iron Bars are to be advanced, but nothing definite is yet known. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.73c., with half extras; the same, in smaller lots, 2c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same, in smaller lots, 1.85c., with full extras: Base Angles, 1.83c., in carload lots; Beams and Channels, in carload lots, 1.83c.; Plates, ¼-in. and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16 gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14 gauge, in carload lots, 2.05c.; in small lots, 2.60c.; Steel Tire, 1 x ¼ in. or heavier, 1.83c., in carload lots.

Old Material.—There has been a steady increase in the demand for Scrap and prices are hardening. Melters are using a large tonnage of Cast Scrap because of the shortage of Pig Iron, and stocks are considerably depleted. We quote dealers' prices, f.o.b. Cincinnati, as follows:

No. 1 Railroad Wrought, net ton	$18.00 to $19.00
Cast Borings, net ton	9.00 to 10.00
Steel Turnings, net ton	11.00 to 12.00
No. 1 Cast Scrap, net ton	16.00 to 17.00
Old Iron Axles, net ton	26.00 to 27.00
Old Iron Rails, gross ton	24.50
Old Steel Rails, long, gross ton	17.00 to 18.00
Relaying Rails, 56 lb. and up, gross ton	28.00 to 29.00
Old Car Wheels, gross ton	18.00 to 19.00
Low Phosphorus Scrap, gross ton	19.00 to 20.00

Birmingham.

BIRMINGHAM, ALA., October 28, 1906.

Pig Iron.—The efforts of the conservative producers to hold the market in check have been without avail and prices for next year's delivery have jumped $1.50 per ton. The best quotation now obtainable for delivery the first quarter of 1907 is $17.50 on a No. 2 Foundry basis, and sales have been entered all the way up to $19 in the past few days. The producers in this district, with but two exceptions, have withdrawn from the market for that period, and one of these has but a limited tonnage to offer, while the other having only one stack can naturally cut but a small figure. For second quarter delivery the market is firm at $17.50, the producers claiming to have already booked a large percentage of their estimated production. From all indications it would appear that many of the melters who failed to cover for their requirements for this year are determined not to be caught again and are now contracting for the first half. Also a number of those who are now enjoying low priced Iron and have felt that the increased production would prevent any material advance and consequently have failed to cover for next year, are just awakening to the fact that it is highly probable that they will soon be in the same position as their unfortunate brothers who are now buying from hand to mouth and picking up a car where it can be found. This determination on the part of the buyers to cover at once has started a fresh buying movement and prices are soaring, many predicting that all Iron that can be made in the first half of next year will be contracted for before the holidays. As high as $20 per ton is being paid for spot Iron, while one large interest places quotations at $21 to $22, which will undoubtedly be secured unless there is an immediate improvement in both production and transportation facilities. The car situation the past week has been the worst yet, the one or two railroads which have been able to furnish a fairly good supply up to the present time having exhausted their resources. Much complaint about deliveries is being heard, and while the furnaces as a usual thing have the Iron which has been contracted on their yards, they are powerless to deliver it under the existing car situation.

Cast Iron Pipe.—Inquiry for Pipe for delivery next year is all that could be desired; in fact, rather more than is desired by some of the foundries, as owing to the unsettled condition of the Iron market and the scarcity of skilled labor it is hard to figure with any accuracy just what the product will cost another year. Quotations on Water Pipe remain unchanged, and are approximately as follows: 4 to 6 in., $31; 8 to 12 in., $30; over 12-in., $27.50, with $1 per ton extra for Gas Pipe. On large contracts these prices might be slightly shaded.

Old Material.—The market is strong, and prices on several grades have been advanced from 50c. to $1 per ton during the past week. The large stocks which had accumulated on yards are practically gone, and inquiries are far in advance of what dealers are able to furnish. Dealers' quotations have been revised, and are approximately as follows per gross ton, f.o.b. cars here:

Old Iron Rails	$20.00 to $20.50
Old Iron Axles	18.50 to 19.00
Old Steel Axles	16.00 to 17.00
Old Car Wheels	17.00 to 18.00
No. 1 Railroad Wrought	17.00 to 17.50
No. 2 Railroad Wrought	14.50 to 15.00
No. 1 Country Wrought	14.50 to 15.00
No. 2 Country Wrought	11.50 to 12.00
Wrought Pipe and Flues	11.50 to 12.00
Railroad Malleable	13.00 to 13.50
No. 1 Steel	13.50 to 14.00
No. 1 Machinery Cast	14.50 to 15.00
Stove Plate and Light Cast	10.50 to 11.00
Cast Borings	7.50 to 8.00

Cleveland.

CLEVELAND, OHIO, October 30, 1906.

Iron Ore.—The time is approaching rapidly when some sales of Ore will be made for 1907 delivery, although shippers have been holding buyers off as long as possible. Many furnace interests, seeing the enormous business piling up for next year, are beginning to get uneasy about their Ore supply and are more than usually anxious to cover their needs. Reports tend to confirm the statement made last week that there is to be a difference in the advance on Bessemer and non-Bessemer Ores. It is now said that Bessemer Ores will be advanced 75c. a ton and non-Bessemers 50c., which would establish the prices for next year's delivery on the following basis, standard analysis, f.o.b. Lake Erie ports: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.25, and Mesaba non-Bessemer, $4. The movement of Ore down the lakes has been interrupted to some extent by the growing car shortage, which is now reaching serious proportions, especially in the lower lake region. Railroads have been moving Ore away from the docks and returning the cars light. This was detrimental to other trades and they are now being loaded in both directions, even when it means a cross countr run. The result naturally has been to lessen the cars available for the movement of Ore from lake docks to furnace stock piles. This has increased the delay of boats in port. This may interfere slightly with the efforts of the shippers to complete the movement on contract by early in November, although the delay has not been really serious. On this account considerable interest is manifested in the movement of Ore in October. Last year the October shipments were 4,257,000 tons. It is understood that there has been an equally heavy movement for this month, and some estimates are that the total will exceed 4,500,000 tons. This is taken as assuring definitely an aggregate movement of at least 36,000,000 tons for this year, no matter what sort of delays may be encountered hereafter.

Pig Iron.—The shortage of Foundry Iron in this territory is rapidly reaching the acute stage, and there is beginning to be heard talk of $25 Iron before the end of the first half of next year. Some anticipate such a price much earlier and the tendency is in that direction. The past week some sales of No. 2 for November and December shipment have been made at $22.50 at the furnace. A small lot was sold for delivery the first half of next year at $22 at the furnace, but this was really an exception, the furnace quoting the price to discourage the business away if possible. Other sales in good round lots have been made as high as $21, Valley furnace, for delivery over the first half. Inquiries have been unusually heavy and indicate, more clearly than was possible a week ago, that many consumers have not covered their needs for the first half and are now being forced to pay the higher prices demanded. Known inquiries appearing in Cleveland on Monday were for an aggregate tonnage of over 15,000. Southern producers are about out of this market, although a little Iron is being offered for second quarter delivery at $18 and some small lots are offered for spot shipment at $20, Birmingham. One of the biggest inquiries in is for No. 3 Foundry for first quarter delivery, on which the price quoted has been $20, Valley furnace. Basic Iron is exceptionally strong, one inquiry Monday amounting to 3000 tons and other good sized lots being in demand. Quotations rule at $19 to $19.50, Valley furnace, for first half, and $21 for spot shipment.

Coke.—Coke is stronger. The best grade of 72-hour Foundry is quoted at $4 at oven for first half, and Furnace at $3.25 at oven.

Finished Iron and Steel.—Referring to the general Steel trade in this territory, one of the largest dealers said here to-day: "The market is strong all around—a little too strong. I am afraid of it." This statement followed the announcement that the price of Sheets had been advanced $2 a ton, and that Forging Billets sold here to-day and yesterday at $40 at the mill. The Sheet market has been expecting the advance, and undoubtedly some of the good buying recently reported has been in anticipation of this rise. The demand, however, is still active. While one dealer in this territory reports sales of Forging Billets at $40 at the mill, others quote $28 to $39, delivered, which seems to be about the market, except for small lots for immediate use. Rerolling Billets are exceptionally scarce and the price ranges at about $29 to $30 at the mills. Bar Iron is in short supply and general quotations are about 1.70c. to 1.75c., Pittsburgh. On the basis of Scrap prices, many are inclined to believe that higher prices are warranted. Sales have been so light as to afford a poor criterion by which to judge the market. Bar Steel is selling at 1.60c., Pittsburgh, and higher. The past week four more ship orders have been taken by lake builders. One came to Cleveland and three went to Detroit. Three of these boats were for the package freight trade. This gives the American Shipbuilding Company 45 boats under construction and under contract, including, however, four which have been launched recently and are to be supplied with machinery. The demand for Structural Shapes is strong, and some consumers having immediate needs to fill are paying a premium of $2 to $3 a ton and higher freight rates. Plates are also strong, with the leading mills falling behind their orders.

Old Material.—The Scrap trade is very much mixed at present. Dealers are buying heavily and sometimes pay as high prices as are generally quoted to the trade. There is some good, strong buying by the various consumers, but the demand does not appear to be quite as general as the prices would indicate. It is admitted that prices quoted herein have been exceeded, but the following are about the range, f.o.b. Cleveland, per gross ton: Old Steel Rails, $18 to $19; Old Iron Rails, $25.50 to $26.50; Iron Car Axles, $21.50 to $22; Heavy Melting Steel, $18 to $19. Per net ton: Cast Borings, $9.50 to $10.50; No. 1 Busheling, $15.50 to $16; No. 1 Railroad Wrought, $18 to $18.50; No. 1 Cast, $17; Iron and Steel Turnings and Drillings, $12 to $12.50.

The Cleveland Iron & Metal Company, Cleveland, formerly at Seneca and Jefferson streets, is now located in its new yard at 2432 West Third street, S. W., and is now in a better position to handle all kinds of Iron and Steel Scrap.

The Coal Trade.

BY FREDERICK E. SAWARD.

Soft coal figures are higher than they were at the opening of last month, and the prospect is for further increases, as the car shortage gets to be more of an actuality than it is even at the present time, and now it is said to be bad enough in some sections. Car shortage is well known, but there is likely to be vessel shortage this winter in the coastwise trade. The loss of vessels engaged in the Gulf trade was very great during the recent storms in that locality; that will mean a drawing away of the regular colliers on the coast to go into this other and more profitable line of business. It will be well for those who yet have coal to get to push for the delivery thereof while the weather holds good. There was some disarrangement of transportation on the lakes during the recent blizzard, though no vessel tonnage can actually be said to be out of commission.

The following may be quoted as prices for soft coal at New York loading ports, per gross ton:

Georges Creek	$3.25 to $3.35
High grade three-quarter lump	3.15 to 3.25
High grade gas, run of mine	3.00 to 3.20
Best Miller Vein coals	2.75 to 3.00
Good Miller and Moshannon	2.50 to 2.75
Best Somerset	2.75 to 2.85
Fairmont, three-quarter	2.85 to 2.90
Fairmont, run of mine	2.75 to 2.85

Bituminous at the mines is $1.75 for Georges Creek, $1.35 for Pennsylvania of best grades, $1.20 for West Virginia of best grades and $1.10 for run of mine, all tons of 2000 lb. Inferior coals, or odds and ends, may often be had for a few cents less, but there is a very strong undertone to the market.

The price of soft coal has been increased in all parts of the country, and the West is getting a taste of higher values, the same as the East. There is an increase of 25 to 45 cents a ton over summer prices at all points, such as Detroit, Milwaukee, Chicago and Duluth. There has been an increase of 20 cents a ton in lake freights recently, which is also used as an argument to sustain the increase of 45 cents a ton on soft coal, which is one of the highest jumps that this article has made at a single bound in many years. Up to October 1 there had been received on Lake Superior 1,500,000 tons more of soft coal than had been received to that date in 1905, and with this big increase before them the coal men found that their stocks on that date were below the normal.

Viewing the situation in the fuel trade in its entirety, one cannot but regard its present position as an improvement over what was the case at the beginning of October. Prices of soft coal have actually come up to a better position, on the whole, and there should be further improvement therein from the reasons given above. One does not need to be told that anthracite is in good form, for by the adjustment of values made three years ago, and renewed the past spring, the price is on a fair basis; production will proceed without any great interruption, as far as one can foresee, with actual distribution accentuated as the temperature warrants a larger use thereof.

As to the anthracite steam sizes, it can be said that pea coal has picked up materially in demand, and in the case of many kinds of the better grades is subject now to delay in shipment. Buckwheat is especially strong, even in the washery grades, and at much higher figures than prevailed on the same grades a year ago. The quantity coming to tidewater is somewhat lighter. The demand for No. 2 rice is also very strong, outside of the fact that one of the shippers continues to sell at low prices when he has coal to offer. The returns received on No. 2 buckwheat are much better than were returned a year ago. No. 3 buckwheat is in good demand, but the quantity being shipped is sufficiently large to keep the prices steady and no premiums are being paid for it.

Good free burning pea is offered at $2.70 to $3 at the tide ports. Buckwheat is $2.35 to $2.50, with rice at $1.50 to $1.85. Washery pea is $2.85; buckwheat, $2.25; rice, $1.75 to $1.80; barley, $1.25 to $1.45, all gross tons.

In all industrial sections the consumption of bituminous coal is steadily on the increase, and the demand is bettering itself slowly all the time. While the consumption is going on at a tremendous pace, the car supply is short and loading slow at many places, yet the fact remains, nevertheless, that an enormous quantity of coal is used in New England every week. It is certain that the demand has overtaken the supply and that stocks will be steadily disappearing. It is not alone a matter of short car supply, but the railroads are short of motive power and terminal room, and these conditions, with serious congestions of traffic, are bound to continue for many weeks. Many of the large buyers have held off from shipping, and are coming into the market very slowly. They surely have made a mistake. Prices are already firmer, and in no uncertain manner indications point to a constantly advancing market and increasing difficulty in securing prompt shipments. The general industrial conditions were never better. Mills are working to their full capacity, and the water supply is poor, which necessitates more steam power than usual and a greater consumption of bituminous coal.

An effort is being made to introduce a sliding scale contract on soft coal in New England on the same plan that prevails with the anthracite producers. It is said that it is getting to be a very difficult matter to get a great many consumers to take in any contract coal while the market price is less than that at which they have contracted, while on the other hand numerous shippers do not feel under any serious obligation toward their contracts when the market price is considerably more than they are getting on contract. There is much to be said on both sides of such a question, as neither the shipper nor the consumer has the confidence in each other that should prevail. If, instead of naming a flat price for contract, the shippers could get together on a basis that would make a difference of about 25 cents between summer and winter prices, making the average price about the same as now prevails, it would certainly be more satisfactory from the standpoint of the producer as well as the consumer. In this way the manufacturer who could (and would) put in his coal during the summer would do so to his own financial advantage, leaving free such amount of coal as might be produced through the winter months for the benefit of those who are not able to take in their coal through the summer.

With the conditions existing now in regard to the car shortage there is much speculation as to the future, when railroads begin to suffer from severe weather. The demand for coal will be much greater and it will be practically impossible to get any cars. Congestions of unusual dimensions will follow, and the experiences of 1903 will be lived over again in even greater proportions. Well informed operators are solicitous as to the future, and many are advising their customers to prepare early for the worst.

In one day last week the new Bessemer plant of the Youngstown Sheet & Tube Company, Youngstown, Ohio, turned out 1045 tons of finished steel.

New York.

NEW YORK, October 31, 1906.

Pig Iron.—The buying of Foundry Iron has continued on a considerable scale during the past week and the high range of prices has caused no curtailment in demand. Both large and small buyers are apparently still in need of metal for this year and are paying in the neighborhood of $25, delivered, for No. 2 Foundry Iron. For delivery in the first quarter of 1907 Eastern furnaces are generally asking $22 at furnace, and in some cases this also is the basis for deliveries in the second quarter. Virginia and Alabama furnaces have advanced their prices in the week. The former are now quoting No. 2 Iron at $20 to $21 at furnace for next year's delivery, and the latter quote $17.50. Some sales of Basic have been made at close to $22, delivered in eastern Pennsylvania, and rolling mills are buying moderately of Gray Forge on the basis of $20, delivered. There is more inquiry for foreign Iron and consumers are more willing to accept it than has been the case heretofore. For No. 1 Scotch the market is about $23, New York; for No. 1 Middlesbrough, $21.50 to $22; for No. 3 Middlesbrough, $20.60 to $20.75. We quote for spot Northern Foundry Iron $25 for No. 1 and $24.50 to $25 for No. 2. For 1907 deliveries the range is $23 to $23.50 for No. 1 Foundry and $22.50 to $23 for No. 2 Foundry. Tennessee and Alabama furnaces have advanced their prices to a basis of $17.50, Birmingham, for No. 2, delivered next year, or $21.50, New York.

Steel Rails.—Orders from Frog and Crossing manufacturers and from traction lines have formed the bulk of the tonnage placed in the past week, the total of these orders running up to the surprising figure of about 50,000 tons, of which the greater part was for Frog and Crossing work. Some heavy tonnages are under negotiations, the list of prospective buyers, including the Seaboard Air Line, the Atlantic Coast Line, the New York, New Haven & Hartford and the Delaware & Hudson. Two large inquiries from trolley lines are also up, amounting together to about 40,000 tons. Fully 200,000 tons are under negotiation at the present time. Foreign business is more active, and after a period in which the domestic mills have been unable to entertain export propositions, some business is being placed for 1907 and for deliveries running into 1908. The Guayaquil & Quito road in Ecuador, which has been a considerable buyer of American Rails in the past 10 years, has just closed with the United States Steel Products Export Company for 30,000 tons, to be delivered in the second half of 1907 and the early part of 1908.

Structural Material.—Bridge work has contributed the bulk of the orders booked by important construction and fabricating companies in the past week, following the letting of the 14,000-ton contract for the City Investment Company's Building to Post & McCord, the Steel work going to the American Bridge Company. For the month of October the latter company's bookings will amount to about 60,000 tons, the most important contract being 17,000 tons of bridges for the Northern Pacific Railroad taken in the past week. The New York, New Haven & Hartford Railroad placed 4500 tons of bridge work, a considerable portion going to the Pennsylvania Steel Company and the remainder being divided among the Schuylkill Bridge Works of Philadelphia; McClintic-Marshall Construction Company, Pittsburgh, and Milliken Brothers, Incorporated, New York. This road is expected to contract for about 4000 tons additional to cover the remainder of its small bridge construction in 1907. The Lackawanna road is in the market for 4500 tons, which represents its requirements for 1907. In the building line the Academy of Music in Brooklyn is the principal contract let in the past week, the Steel amounting to 2300 tons, taken by the American Bridge Company. Several building contracts of moderate size in New York and other work on the Pacific Coast are pending. More business could be done with San Francisco were it not that investors there are deciding to await the carrying on of their plans until the price of labor falls to a reasonable basis. Among the export orders of the week is a 500-ton contract for a sugar refinery in Hawaii, taken by Milliken Brothers, Incorporated. From jobbers and various consumers the Structural mills continue to book orders calling for deliveries to July 1, 1907. We quote on mill shipments for tidewater delivery as follows: Beams, Channels, Angles and Zees, 1.84½c.; Tees, 1.89½c.; Bulb Angles and Deck Beams, 1.99½c. On Beams 18 to 24 in. and on Angles over 6 in. the extra is 0.10c. Sales out of stock of material cut to length continue to be made at 2¼c. to 2½c.

Bars.—Some excellent contracts for Bar Iron have been placed, and the general demand is so strong that prices have been further advanced and the minimum now appears to be 1.70c., Pittsburgh, for Best Refined, which is equivalent to 1.84½c., tidewater. The Eastern mills which have been kept idle by strikes are gradually overcoming their difficulties and starting up. Another mill has been added to the active list the past week. The demand for Steel Bars is excellent, and while the official price of 1.50c., Pittsburgh, is still quoted by the largest manufacturers, consumers who desire fairly early delivery are obliged to purchase from other mills at varying premiums.

Plates.—Transactions have recently been of moderate size, no large orders having come on the market, so far as can be ascertained. The daily business consists of a good run of small orders from general consumers. The Eastern mills are not only well employed, but some of them are so crowded with work that it would not be surprising to find that premiums are asked for early shipments. Quotations on general business are as follows at tidewater on carload shipments: Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine Plates, 2.14½c. to 2.24½c.; Firebox Plates, 2.24½c. to 2.60c., according to specifications.

Cast Iron Pipe.—The city of Philadelphia will this week open bids on about 2000 tons of 4 and 6 in. Pipe for water purposes. The demand from the general trade continues strong and foundries are steadily booking business for delivery next year. Prices on such deliveries are fully as strong as prices asked for nearer shipment. Carload lots of 6 in. are quoted at a minimum of $32 per net ton at tidewater.

Old Material.—No. 1 Heavy Cast Scrap and Stove Plate appear to be in greater demand than ever, with little stock to be had at any price. Sales have been made at fully 25c. per ton above prices realized the previous week. No. 1 Railroad Wrought and No. 1 City Wrought have been moving a little more freely and are commanding full outside figures. Heavy Melting Steel Scrap is in somewhat better demand, and shipments are being made to various localities at prices a little better than would be realized by shipping to eastern Pennsylvania. An important company in New Jersey, whose Open Hearth Steel department has recently been finished, has come into the market and purchased several thousand tons of Heavy Melting Steel Scrap and Old Steel Rails at prices that were more attractive than eastern Pennsylvania works offered. Wrought Pipe, Cast Borings and Wrought Turnings are in good demand and selling at full prices. One of the leading dealers in this city sold about 8000 tons of Scrap since last Friday, comprising 2000 tons of Stove Plate, 1000 tons of Heavy Cast Scrap for foundry purposes, 3000 tons of Heavy Melting Steel Scrap, 1000 tons of Borings and Turnings and 1000 tons of No. 1 Railroad Wrought. Approximate prices for New York and vicinity per gross ton are as follows:

Old Iron Rails	$24.50 to $25.00
Relaying Rails	28.00 to 28.50
Old Steel Rails, rerolling lengths	18.50 to 19.00
Old Steel Rails, short pieces	16.25 to 16.75
Heavy Melting Steel Scrap	16.25 to 16.75
Standard Hammered Iron Car Axles	29.00 to 30.00
Old Steel Car Axles	22.00 to 22.50
No. 1 Railroad Wrought	21.00 to 21.50
Iron Track Scrap	18.00 to 18.50
No. 1 Yard Wrought, long	18.50 to 19.00
No. 1 Yard Wrought, short	18.00 to 18.50
Wrought Pipe	14.50 to 15.00
Light Iron	10.00 to 11.00
Cast Borings	10.00 to 11.00
Wrought Turnings	13.00 to 14.00
Old Car Wheels	19.75 to 20.00
No. 1 Machinery Cast	17.25 to 17.75
Stove Plate	13.75 to 14.25
Grate Bars	12.75 to 13.25
Malleable Cast	17.50 to 18.00

Metal Market.

NEW YORK, October 31, 1906.

Pig Tin.—Lower prices last week resulted in more trading, and there has been a better buying movement than for a number of weeks. An event which has caused more than usual interest is the report that the United States Steel Corporation had entered the London market as a seller of Pig Tin. Some reports credit this company with selling as high as 500 tons, but in other quarters the figures given are but 200 tons. It is also said that 100 tons of metal will be reshipped to London on the Mesaba. In any event there has been a break of about £8; the metal closing in London to-day at £192 12s. 6d. for spot and £194 2s. 6d. for futures. Just why this company should not take profits at present is hard to understand, but it is a question whether it has simply been disposing of a surplus, or will enter the Tin markets of the world as a speculator in order to secure its own supplies cheaper. Sales were made last week at 42.75c. to 43.25c., and this week at 42c. to 42.40c., closing to-day at 42.25c. The arrivals so far this month are 3295 tons.

Copper.—The market has been very dull, and although we learn of a sale of Electrolytic at about 21.50c. to 21.75c., there seems to be no general disposition to shade prices. Lake is scarce and any lots that are offered are held at 22.25c. to 23c. It is scarcely to be expected that there will be any large demand for the metal at present, as some consumers are well supplied for this year's needs, while others will not require any large amount before December. In a retail way sales have been made at considerably higher figures, but these furnish no criterian for the general trade. The decline on the London Exchange has continued and standard warrants are now held at £97 5s. for spot and £98

for futures, Best Selected being held at £103. This has naturally given rise to some unrest on the part of consumers, and it may be that not a few have deferred purchases for this season. It should be noted that the decline was largely in speculative Copper rather than in the refined metal, as the total drop in Best Selected is £4, while in spot warrants it is £5 15s. The foreign demand is very heavy, the exports for 30 days this month being 16,213 tons.

Pig Lead.—The demand is excellent, considering the season of the year. Prices are unchanged from a week ago, New York holders asking 5.90c. to 5.95c. for carload lots. The St. Louis market is also held at 5.90c. The American Smelting & Refining Company is only taking orders at the price current on date of shipment, the price governing outstanding contracts being 5.75c.

Spelter.—Prices are steady, Spelter being held at 6.30c. to 6.32½., New York, and 6.17½c., St. Louis.

Antimony.—Prices are unchanged. Cookson's is held at 25.50c.; Hallett's at 25c., and other brands 24.25c. to 24.75c.

Ferroalloys.—There is a good demand for Ferrosilicon at the higher price of $104 a ton. Ferromanganese is unchanged at $80 a ton at interior points. Ferrochrome can be had on the basis of $150.

Nickel.—There is a steady demand at the unchanged price of 45c. per lb. for ton lots and 55c. to 60c. for smaller quantities.

Tin Plates.—An advance of 15c. per base box was made by Tin Plate manufacturers October 25. Bright Plates in New York are now held at $4.09 and $3.90 in Pittsburgh, subject to the usual trade discounts. This is the highest price since October, 1902. Deliveries are still very much belated, but there is an excellent demand. In Swansea Welsh Plates are unchanged at 14s.

Old Metals.—There is a fair demand, but the decline of Copper in London has, in a measure, taken the edge off the market, and although no lower quotations are being made generally, still buyers are holding off. We note an easing of prices on Light Copper and Light Brass. Dealers' selling prices are as follows:

	Cents.
Copper, Heavy Cut and Crucible	20.50 to 21.50
Copper, Heavy and Wire	20.50 to 21.00
Copper, Light and Bottoms	18.75 to 19.75
Brass, Heavy	15.00 to 15.50
Brass, Light	12.00 to 12.50
Heavy Machine Composition	19.00 to 20.00
Clean Brass Turnings	13.75 to 14.25
Composition Turnings	17.00 to 18.00
Lead, Heavy	5.75
Tea Lead	5.50
Zinc Scrap	4.75

Iron and Industrial Stocks.

NEW YORK, October 31, 1906.

Fluctuations have been narrow for some time and transactions have been rather restricted. The approaching election in this State is regarded with sufficient apprehension to cause operations on the Stock Exchange to be conducted conservatively, and operators are not without the fear of dearer money. The market, nevertheless, has been fairly strong, and in some instances prices have been higher than a week ago. United States Steel common, which sold at 45⅞ on Tuesday of last week and at 45⅝ on Friday, touched 48⅛ on Monday. The preferred advanced from 105¾ to 106¾ in the same time. Pressed Steel common, which sold at 54¾ on Thursday, declined to 53¼ on Friday, as a result of disappointment over the action of the Board of Directors, who decided not to declare a dividend on Thursday, as had been expected. The stock, however, recovered, selling up to 54½ on Monday. The range of prices on other active industrials during the past week has been as follows: Car & Foundry common 43¼ to 44½; Locomotive common 73½ to 75; Colorado Fuel 50¼ to 53⅛; Railway Spring common 51¾ to 52⅛; Republic common 34¾ to 36½, preferred 96½ to 97; Sloss-Sheffield common 71 to 72; Tennessee Coal 155 to 157½; United States Cast Iron Pipe common 46⅝ to 47⅛, preferred 89 to 90¾. Last transactions on active stocks up to 1.30 p.m. to-day are reported at the following prices: Car & Foundry common 43⅞, preferred 101½; Locomotive common 74, preferred 111; Steel Foundries common 9⅞, preferred 43¾; Colorado Fuel 51⅞; Pressed Steel common 54, preferred 98¾; Railway Spring common 51½; Republic common 35, preferred 98; Sloss-Sheffield common 72; Tennessee Coal 156¾; United States Cast Iron Pipe common 46¾, preferred 89¾; United States Steel common 46⅝, preferred 106½; Can common 6¼, preferred 55½.

President F. B. Smith of the Crucible Steel Company of America is reported to have stated that the quarterly dividend on the preferred to be declared in December would be at the full rate of 1¾ per cent. There is due in back dividends about 16½ per cent. on the preferred stock. At the last dividend meeting, it is learned, officers objected to declaring the full rate until an outstanding note for $271,000 had been lifted. This note was taken up on October 21. Orders on the books of the company are now 25 per cent. in excess of a year ago. Earnings at this time are said to be at the rate of $4,000,000 a year.

Dividends.—The Pressed Steel Car Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable November 28.

The Hamilton Machine Tool Company, Hamilton, Ohio, has declared a quarterly dividend of 1½ per cent. on its preferred stock, payable November 1.

The United States Steel Corporation has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock and one-half of 1 per cent. on the common stock, the former payable November 30 and the latter payable December 31.

Labor Notes.

The Supreme Court of Massachusetts has handed down an interesting decision affecting the rights of labor unions in that it defines the illegality of a certain form of sympathetic strike. The case is that of Picket *et al. vs.* the Bricklayers' Benevolent and Protective Union No. 3 *et al.*, in which the plaintiffs are nonunion stone pointers who were hired by the owner of the building upon which the defendants were employed by a contractor. The defendants called a strike on several buildings for which their employer, the L. P. Soule & Son Company, had the contracts, because the owners of one of these buildings, the Ford Building, Boston, refused to discharge the nonunion stone pointers who were employed by him and not by the contractor. Other more familiar issues were involved. The court states in its decision: "That strike has an element in it like in a sympathetic strike, in a boycott and in a blacklisting—namely, it is a refusal to work for A, with whom the strikers have no dispute, because A works for B, with whom the strikers have a dispute, for the purpose of forcing A to force B to yield to the strikers' demands. . . . Such a strike is not a justifiable interference with the right of the plaintiffs to pursue their calling as they think best. In our opinion organized labor's right of coercion and compulsion is limited to persons with whom the organization has a trade dispute; or to put it in another way, we are of opinion that a strike on A, with whom the striker has no trade dispute, to compel A to force B to yield to the strikers' demands is an unjustifiable interference with the right of A to pursue his calling as he thinks best."

About 200 car workers, most of them members of the Machinists' Union, employed at the repair shops of the Boston & Albany Division of the New York Central Railroad, Allston, Mass., have gone on strike because of the refusal of the company to grant an increase in wages and to abolish the piece system.

Conditions in the various New England foundries in which the Molders' Union has ordered strikes during the past six months have practically returned to normal. In some cases an adjustment of differences between employer and employees has been effected and in others, although the strike is still on, the foundries are running about as usual, the places of the union men having been filled. A number of foundries have consequently been changed from a union basis to that of the open shop.

A verdict of guilty was returned at Boston recently in a test case brought by the Government against William H. Ellis, a contractor, charged with violating the Federal eight-hour law on work at the Charlestown Navy Yard. The defense claimed that emergencies made nine-hour work necessary. The cases will be appealed on constitutional grounds. Six months' imprisonment or $1000 fine, or both, may be imposed.

The Anchor Line closed a contract recently with the American Shipbuilding Company for the construction of a 5000-ton steel freighter, to be built at the Buffalo plant of that company. The steamer is to be a duplicate of the Muncy of the Anchor Line, is to cost $300,000 and to be ready for service July 15, 1907.

Different Plans of Letting Contracts.

In a paper presented before the American Public Works Association Frank B. Gilbreth, New York, discusses "Lump Sum," "Percentage" and "Cost-Plus-a-Fixed-Sum" contracts. Under the "Lump Sum" contract the contractor agrees to furnish all labor and material necessary to complete a certain definite piece of work for a definite lump sum or at unit prices, which means several lump sums. The writer argues that under this form the interests of the owner and contractor are opposed from start to finish. Every cent that the contractor can save goes into his own pocket, but every cent the owner pays does not necessarily represent value received, since the owner may be paying not only noncompetitive prices for extra work, but a large item of interest on his investment, and also for loss of rent, because the work is not progressing any faster than the rate of speed of greatest economy to the contractor. Any saving in time taken for riveting steel work, in quantity of cement used, or in labor of mixing concrete, though the requirements of the specifications may be met, is a saving to the contractor.

Under the "Percentage" contract the contractor agrees to furnish all labor and materials necessary to complete the work for cost plus an agreed percentage of such cost. This form of contract, the writer says, is very nearly perfect—but not quite. "The owner can regulate the speed and the time of completion. He can decide whether or not he will give way to strikers or substitute nonunion men. The interests of the owner and the contractor are identical so far as speed of construction and the desire to obtain good work are concerned. So far, the chances of continued pleasant relations would be good if it were not for the fact that the owner is apt to suspect that the contractor may be increasing the cost of the work for the sake of getting more profit, for the contractor's profit is in this case directly proportional to the cost of the undertaking."

The "Cost-Plus-a-Fixed-Sum" form has all the advantages of the "Percentage" contract, but without the one disadvantage of the latter; there is no incentive to the contractor to increase the cost, since it would not increase his profit. The owner is relieved of extra work. He has the benefit of all cash discounts for material and the owner, engineer or architect can make changes and alterations at any time without delaying the work. The benefits of the "Cost-Plus-a-Fixed-Sum" contract, taken from the contractor's viewpoint, are: The contractor has the opportunity to win upon his merits an enviable position in the confidence of the business world. The contractor's profit on a piece of work is assured. The contractor will be free from relations with owners who have not the courage to take legitimate risks attendant upon their own enterprises, and who wish to saddle them upon a contractor on a lump sum basis and leave him to gamble his way out as best he can. The contractor has, on the other hand, the satisfaction of dealing with an owner who has no reason to suspect him of overreaching, who is not in constant dread of extortionate charges for "extra work," and who, in a word, has a contract offering complete insight to the financial affairs of the job.

Of "Cost-Plus-a-Fixed-Sum" contracts in which the contractor guarantees a maximum cost the writer of the paper has this to say: "At first glance these look as if they had all the advantages of the 'Cost-Plus-a-Fixed-Sum' contract and the 'Lump Sum' contract combined, but they have nothing of the sort. On the other hand, they are absolutely nothing more or less than 'Lump Sum' contracts (if they have a guaranteed maximum cost) and the 'Fixed Sum' is 'fixed' only in case the maximum is not reached. The entire theory of the 'Cost-Plus-a-Fixed-Sum' contract is that the owner shall have his own way in any and all matters pertaining to his work. He shall have the right to decide what materials shall be bought and whether or not they shall be bought of the lowest bidder. He shall have the right to order the contractor to put on as many or as few men as the owner wants regardless of whether or not there are strikes. His decision shall be final regarding the paying of bonuses for the quick delivery of material, and his decision shall be final on all matters pertaining to the conduct of the job. It is obvious that under these conditions it is ridiculous to expect any contractor to guarantee any maximum cost. If the 'Cost-Plus-a-Fixed-Sum' contract is to be used, let the owner pay for all of the actual cash cost and have it understood how much actual profit the contractor is to have, and that the entire 'Fixed Sum' is to be net profit to the contractor."

The Electric Furnace in Europe.

In a lecture by Dr. R. S. Hutton of Manchester University, at Sheffield, England, on October 1, on the application of the electric furnace to the metallurgy of iron and steel, it was stated that steam generated electricity could be obtained in Great Britain under favorable conditions at a total cost of a farthing (¼d.) per unit, or £6 16s. per horsepower-year. The lecturer added that the cost must be further cut down to 1-10d. per unit to yield power as cheaply as it could be obtained in those foreign countries most favorably situated in regard to water-power. In one case of which he had figures by the use of gas engines electricity has been obtained in a continuous supply at 0.105d. per unit, inclusive of interest and other charges.

Referring to present applications of the electric furnace in metallurgy, it was stated that 80,000 hp. is now so employed in the production of aluminum, and a large amount of power is devoted by means of the electric furnace to the production of calcium carbide. The chief field at present open to the electrical furnace in iron and steel metallurgy is in the production of ferroalloys, and in this connection Dr. Hutton gave interesting figures as to the furnaces in the South of France, where the most important plants are situated. At Grenoble five furnaces of 1200 hp. and four of 2000 hp. are used for the maufacture of ferrosilicon, ferrochromium, silicospiegels of varying composition and manganese silicon. The output is between 7900 and 8400 tons a year. At Giraud's Works, also in the South of France, there are furnaces of 18,000 hp. shortly to be increased to 40,000 hp., and with an output at present of the value of 9,000,000 francs a year. The production is 5000 tons of ferrosilicon of 50 per cent., 1000 tons of ferrosilicon of 30 per cent., 2000 tons of ferrochromium, 800 to 900 tons of ferrotungsten, 50 tons of ferromolybdenum and 5 to 10 tons of ferrovanadium. It was stated that the most important development of recent years is the application of the electric furnace to the production of ferroalloys of low carbon content. Dr. Hutton considers that there is considerable promise of the adoption of the electric furnace in the manufacture of tool steels. He spoke of a 450-kw. Kjellin induction furnace now at work and said that a large number of these furnaces are now in operation or under construction in Sweden, Switzerland, Spain, Germany, Austria and England. In Germany furnaces are to be found utilizing 725 hp., capacity 24,000 kilos, charge 15,000 kilos and daily output 90,000 to 120,000 kilos.

The Wireless Telegraph Company of Berlin has succeeded in establishing communication between its station erected at Nauen and St. Petersburg, Russia, which in a straight line is about 900 miles from Nauen. The experiments are being continued, it being intended to communicate with the northern shore of Africa, where the Wireless Telegraph Company in the name of the Turkish postal authorities has installed a station at Derna, Tripolis, while another Turkish station has been erected in Patara (Asia Minor), opposite Rhodos Island. Both stations comprise wooden receiving towers 65 meters in hight.

The Buffalo, Rochester & Pittsburgh Railroad has placed an order with the American Locomotive Company for 20 heavy locomotives, which will be built at the shops at Dunkirk, N. Y.

The Machinery Trade.

NEW YORK, October 31, 1906.

It is easy enough for any one having machines of good makes to sell them if early delivery can be given, as at the present time purchasers are hunting up machines instead of being besieged by salesmen eager to take orders. It is surprising to see the bunches of orders and inquiries on merchants' desks, most of them for a few machines only, though some large orders have been received within the past week or two for delivery some months hence. While it is a little difficult to ascertain the name of the companies that are in the market for large lots of machine tools, it can be said with a great deal of truth that about every one using ironworking machinery is in the market for equipment. The difficulty in ferreting out those whose requirements are large is due to the fact that they want the machinery at an early date and only inquire for a few machines from each merchant, hoping in that way to get at least a portion of it. The great demand for machinery is shown in the reports from plants. We are informed that two of the best known companies in the East making various machine tools have practically sold their entire output for 1907. General conditions appear to be perfectly sound in every respect, and there are no indications of even a slight let up in the demand for machinery.

New Steel Car Plant at Hammond.

The Standard Steel Car Company, Frick Building, Pittsburgh, with main works at Butler, Pa., recently bought 380 acres of land at Hammond, Ind., on which it will erect a very large plant for the manufacture of steel cars. The plant originally will have five main buildings, contract for which has been placed with the McClintic-Marshall Construction Company, Pittsburgh, and which will require about 4000 tons of steel. The steel car shop will be contained in a steel building about 1600 ft. long and 300 ft. wide, while the wooden car shop will also be contained in a steel building 1600 ft. long and about 200 ft. wide. The truck shop, paint shop and car house will each be contained in separate steel buildings, ranging in size from 500 to 800 ft. long. We are advised that practically all the tools for these new shops, embracing lathes, planers, drill presses, punches and reamers, have been bought. The new plant will have a capacity for turning out about 60 steel and composite cars per day, the latter being wooden cars with steel underframe. This new plant is expected to be ready for operation about August 1, 1907. The works of this company at Butler, Pa., have been greatly enlarged in the past two or three years, and are now turning out from 90 to 100 steel cars per day, so that when the new plant at Hammond is finished and in operation the Standard Steel Car Company will have a capacity for making from 150 to 160 steel cars per day.

The Chicago Pneumatic Tool Company has prepared a partial list of its machinery requirements, and is about ready to send out specifications for the machinery, which includes one 22-in. x 16-ft. lathe, one 24-in. x 16-ft. lathe, one 48-in. boring and turning mill, one No. 5 plain milling machine, range 50 in. x 12 in. x 21 in.; one 42 x 42 in. x 8 ft. horizontal milling machine, two 6-ft. vertical drill presses, one No. 6 vertical milling machine and one automatic chucking and turning machine. This machinery is required for the company's air compressor plant at Franklin, Pa., where it is enlarging its machine shop by converting the foundry into a machine shop, making one continuous building 120 ft. wide and 685 ft. long. From the extensive improvements being made at that plant it is probable that the company will purchase considerable more machinery than that included in the list which it has just completed. While the machinery will be purchased by the purchasing agent at Chicago, the selection of the machines is in the hands of W. P. Pressinger, manager of the air compressor department, whose headquarters are at 95 Liberty street, New York. At Franklin a new foundry will be built later on, and it is likely that other arrangements will be made for increasing the company's output of air compressors, which is now from 50 to 60 a month. During the first 25 days of October the orders booked by the company have exceeded the same period for last year by 47 per cent., and the entire month of September 37 per cent. The amount of business done for the first nine months in the year has shown an increase of 27 per cent. over the corresponding period of 1905. An order has just been received by cable from Berlin, Germany, for six of its largest compressors. When the improvements at Franklin are completed the company will be able to produce about 75 compressors a month, and even with this increase it is a question whether the company will be able to keep up with its orders.

A new manufacturing plant is to be erected in Brooklyn which will undoubtedly necessitate the purchase of considerable machinery. The plant is to be erected on Fortieth street, between Second and Third avenues, where 31 lots have been purchased for the company by George Alexander, general manager of the Phœnix Cork Company, 198 Chambers street, New York. The name of the company which is to erect the plant and the products have not been made public, but it is understood that plans for the buildings will be prepared shortly.

During the last two weeks some very large orders for certain classes of machine tools have been placed, one of which was referred to in these columns last week. Both of these orders were placed with the Niles-Bement-Pond Company, New York, one of them for 37 milling machines being received from the Mergenthaler Linotype Company, New York, which it is reported in the trade is buying a good deal of additional machinery for improvements it intends to make. The other machine order was from the General Electric Company and covered vertical boring mills aggregating in value $125,000. These mills are in addition to the large list of tools got out by the General Electric Company the latter part of June, and are to be installed in the new building at Schenectady, N. Y., 150 x 800 ft., three stories high on one side, which is to be used for manufacturing turbines. The General Electric Company has been buying a great deal of machinery during the past few months for Schenectady, and it is expected that a great deal more will be purchased later on for its Lynn works, where substantial additions are to be built.

Railroad Notes.

The extensive list of machine tools which the Erie Railroad sent out last week is likely to be closed as quickly as possible. The company requested bids to be in on October 27, and it will not be surprising to hear of purchases being made within the next few days. This machinery is required principally for the company's shops at Susquehanna, Pa., where large improvements are to be made, the carying out of which will undoubtedly necessitate the purchase of additional equipment later on.

The Pennsylvania Railroad has not yet made any plans for shops at Harrison, N. J., in connection with the power house which will be located there, but it is probable that the company will build a roundhouse at that point with the necessary equipment for making repairs to steam locomotives and a small repair shop for taking care of the electrical equipment.

The most important of the inquiries emanating from the purchasing department of the Pennsylvania Railroad is an invitation to bid upon one drill tug boat, plans and specifications for which have been forwarded to those who have been invited to make a quotation. The boat is an addition to the equipment for use at South Amboy, N. J. A request for prompt estimates accompanies the letter of inquiry. Blue prints showing details of a hand-operated 15-ton crane have also been sent out. The crane is to have two hoists, and capable of lifting 7½ tons, and to be worked independently of each other. The crane is to have a span of 18 ft. 4 in., from center to center of runway rails. The runway rails are to be 60 lb., American standard. An alternate bid on same capacity of crane with single hoist of 15 tons is requested. A third set of prints have been sent to manufacturers showing West Morrisville freight car repair yard, tracks and buildings, with the request that the manufacturers bid upon a narrow gauge track for this point.

The Minneapolis, St. Paul & Sault Ste. Marie Railroad is to build a new boiler shop, 118 x 206 ft., at Minneapolis, Minn., to cost about $70,000.

The Florida East Coast Railroad is preparing to erect a new machine shop at Miami, Fla., where it has been using a floating shop. This latter will be transferred to another point when the new shop is completed. G. A. Miller, superintendent of motive power and machinery, is located at St. Augustine.

D. E. Baxter & Co., 27 William street, New York, have completed specifications for the power and line equipment for the Charleston & Summerville Electric Railway, which the Baxter Company will begin to construct at once. The road will be a single phase railroad and will run from the Battery, in the city of Charleston, out of Charleston to Summerville, a distance of 27 miles, and the right of way passes with easy curves over a practically level country, the maximum grade being less than 1 per cent. The power house will be located about 9 miles out of the city of Charleston, where two steam railroads intersect, and a portion of the road between the power plant and Charleston will have the largest traffic, both in freight and passenger service, as there are phosphate works and other industries located along the line in that vicinity. The power house equipment will include two 800-hp. Snow gas engines, with a maximum capacity of 920 hp. each. At the city limits of Charleston will be located the transformer station, which will supply a 550-volt current to the eight cars intended principally for city use. The specifications include the following equipment: Two 600-kw. single phase 25-cycle generators, two 70-kw. motor driven exciter sets with transformers, switchboard with bus below at exciter panel, one lamp bracket and shade, one field motor, two ammeters, two rheostat hand wheels, two double pole single throw switches, one double

pole double throw switch for throwing battery on either exciter, one single pole single throw equalizer switch, two circuit breakers with reverse current relays for use with field exciter battery. The exciter field rheostat is to have proper range for use with Tirrill regulator, generator panels complete, feeder panels complete, motor starting panel complete, exciter regulating battery. The builders will use catenary lime construction, with 120-ft. spans; No. 000 hard drawn copper trolley wire, corrugated porcelain insulators, standard stud bracket, stud strain bracket, section break and strain insulators.

Inquiries in the market indicate that the Babylon Electric Light Company, Babylon, L. I., is contemplating buying some power apparatus. The company has inquiries out among other things for a 400-hp. horizontal tubular boiler, and it is understood that a corresponding engine is to be purchased, as well as some other machinery equipment.

The Warner Sugar Refinery at Edgewater, N. J., is undergoing alterations which will result in a considerable addition to the equipment of the company's power plant. The equipment is being purchased by C. B. Warner, 79 Wall street, New York, and among other things he will get two engines aggregating between 600 and 700 hp. and two 500-kw. direct connected generators. I. B. Skillman, 92 William street, is the consulting engineer, but he has nothing to do with the buying.

The estimates of appropriations necessary to continue the work on the Panama Canal made by the Isthmian Canal Commission include $8,923,000 for construction and engineering.

Chicago Machinery Market.

CHICAGO, ILL., October 30, 1906.

The recent announcement of the Chicago & Northwestern Railroad regarding its proposed construction of a large depot and terminals in territory bounded by Madison and Fulton and Canal and Clinton streets has stirred local interest, owing to the effect it will have on the machinery trade in causing its members to seek new locations. This territory embraces "Machinery Row" and has been the home of a large percentage of the machinery trade of Chicago. Real estate brokers are already on the scout for new and suitable locations. The natural tendency will be to drift southward, as the West Side between the river and Halsted street for a considerable distance is already compactly occupied. A number of sites, it is understood, are already in contemplation in southern sections where both river and rail transportation facilities are available. With two-thirds of the property acquired and the remaining in process of acquisition, the work of clearing the ground and constructing the building will begin next spring, and within two years it is expected that the railroad will be operating from this station on a reorganized and up to date system of trackage. The company has already expended $2,000,000 in buying the ground on which the station will stand and in acquiring strips along its right of way. In this territory there are approximately 60 buildings, ranging in hight from one to six stories, about half of them being three and four story structures. Many of them are of a most substantial character. Among the occupants who will be compelled to move are the following: A. D. White Machinery Company, American Woodworking Machinery Company, McDowell, Stocker & Co., E. O. Williams, Witte Gas & Gasoline Engine Company, American Steam Pump Company, Anderson Bros. Brass Foundry, Brown & Sharpe Mfg. Company, Chicago Hardware Foundry Company, A. L. Dawson & Co., William Ganschow Company, Raymond Lead Company, McGregor Company, Crucible Steel Company of America, National Stamping & Electric Works, Garden City Fan Company, Chicago Belting Company, A. Nelson Mfg. Company, J. T. Ryerson & Sons, Gould Company, H. A. Stocker Machinery Company, Cleveland Twist Drill Company, Lamson Cutter Head Company, Sharples Separator Company, Chicago Screw Company, DeLaval Separator Company, Western Valve Company, Macomber & Whyte Rope Company, Chicago Fireproof Covering Company, Advance Paving & Supply Company, Miehle Printing Press & Mfg. Company, Armstrong Mfg. Company, George Nash & Co., Standard Scale & Supply Company.

The Southern Railway has let contract to the Oliver Solitt Company, First National Bank Building, Chicago, for additions to its shops at Knoxville, Tenn. The improvements will consist of a roundhouse, 90 x 360 ft., of brick construction, having concrete engine pits, brick floor and containing 30 stalls; pattern house, one story, 90 x 160 ft., of fireproof construction, with reinforced concrete roof; power house, one story, 80 x 100 ft. The cost of these improvements will be $200,000, including machinery equipment. The same contractor has been awarded contract by this road for a freight house and terminals to be built at Atlanta, Ga., which will cost $150,000.

The Matthews Boat Company, Port Clinton, Ohio, will shortly break ground for a new factory and will in a few days let contract for dredging, one slip 60 x 600 ft. and 8 ft. deep and another 60 x 400 ft. and 12 ft. deep will be dredged. The following equipment for the new factory will be required: One 30-hp. alternating current motor, one 25-hp. motor, one 6 x 30 in. smoothing planer, with feed rolls above and below; one four-side sticker, one roll sander, one universal milling machine, one pipe threading machine, ¼ to 4 in.; one 150-hp. boiler.

The Grand Rapids Hand Screw Company, Grand Rapids, Mich., intends building a new factory in the spring. The matter of equipment will not be decided before two or three months.

The Albion Malleable Iron Company, Albion, Mich., has let contracts for the erection of two foundry buildings. The main building will be 256 ft. square, one story in hight. The other structure, a core building, will be 46 x 140 ft., constructed of brick. It is expected to have the improvements completed by February 1 and they will augment the present capacity about one-third, giving an annual output of from 20,000 to 25,000 tons of castings per year.

The Standard Foundry Company, Detroit, Mich., will soon begin the erection of a new foundry plant on the east side of Chene street, between Guoin and Wight streets. The site for the new plant has a frontage of 300 ft. on Chene street, and extends 136 ft. back to the alley. Architects John Scott & Co. have made plans for a main foundry building, 135 x 200 ft., the interior of which will be unobstructed with columns or supports of any kind. There will be a two-story office building, the first story of which will be used as a pattern and stock room and the second story for offices. There will also be a power house, and the equipment will be modern in every particular. More than 200 men will be employed.

The Corn Products Refining Company, Rookery Building, Chicago, has an option on about 150 acres of land at Joliet, Ill., on the canal, where a large plant contemplated by the company may be located. The president of the company, E. T. Bedford of New York, is expected in Chicago in a few days for the purpose of closing up the deal and to make arrangements for water rights. The plant will have a capacity of 40,000 to 50,000 bushels of corn per day and is estimated to cost $4,000,000 to $5,000,000. Work on the plant will probably be begun in a few months. The company intends to sell the present Chicago plant on West Taylor street, near the river, the proceeds of which it is expected will go far toward the construction of the new plant.

The Whiting Foundry Equipment Company, Harvey, Ill., has increased its capital stock from $400,000 to $700,000 and the number of directors from three to five. A portion of the increase in stock is represented by individual profits and the balance representing additional cash capital which is desired for the purpose of extending the business and making certain betterments, the character of which is not yet divulged.

Philadelphia Machinery Market.

PHILADELPHIA, PA., October 30, 1906.

The volume of business transacted by both manufacturers and machinery merchants in the Philadelphia territory during the month just closing has been generally satisfactory. It compares quite favorably with that of the previous months, and in some instances doubled that transacted in September. The past week has brought out an order from the Western Maryland Railroad for some $20,000 worth of tools for its Hagerstown, Md., shops, which has been under consideration for some time, and the bulk of the business was placed with several of the local concerns. There is little anticipation, however, of any heavy railroad business in the near future. One of the roads which has had extensive purchases under consideration has deferred placing its orders until next spring, and until the lists for next year's requirements are forthcoming, little except scattered orders are anticipated. General orders recently have been largely of the scattered type, but include a more extended sale of the heavier standard and special tools.

Machine tool builders continue as busy as ever. The recent demand has filled order books to such an extent that the probability of catching up on deliveries at an early date seems to be diminishing instead of increasing. While it is true that some classes of machinery can be had fairly promptly, it is also true that such tools as are available are mostly those comprising the least desirable sizes. Where in certain cases manufacturers would be able to do fairly

well on some tools the delays incident to obtaining electric equipment hold up deliveries to a considerable extent. There seems to be no diminution in the volume of inquiries being received. These cover all classes of equipment, but are mostly for individual tools and for small lots for minor extension.

The foreign demand continues good, the majority of the business booked, however, being for tools of a special nature. Such business in the way of standard machine tools as is offered does not receive much attention from the local manufacturers owing to the pressure of domestic orders. Machine shop and power transmission specialties have been in good demand, and those transacting a more or less regularily established business abroad report trade in good condition for the season of the year.

While the demand for boilers and engines of various capacities has been fairly good it is not as active as the trade would like. The local demand, particularly for equipment of the higher powers, is rather weak, and more or less delay is experienced in closing business already under consideration. Second-hand boilers and engines are in greater demand, and if satisfactory equipment can be had little difficulty is experienced in closing the business.

The second-hand machinery market is quite as active, and will no doubt so continue as long as deliveries on new tools are as hard to get as they are at present. The only difficulty experienced by the trade is the ability to keep stocks in such shape so as to be able to meet the demand. As a rule standard tools, particularly those of the medium sizes, if in good condition, find ready sale.

There is no change in the foundry situation. Both iron and steel casting plants, particularly the latter, have their capacities well taken and find considerable difficulty in meeting the demands of machinery manufacturers for early deliveries.

The Hess Machine Works has added an additional floor, 40 x 200 ft., to its plant, which will be largely used for erecting shop purposes. For the equipment of this it will shortly be in the market for a number of tools, including lathes, drills, grinders, &c. Orders for file making machinery, from both foreign and domestic sources, have been good, and recent shipments include eight sets of machines for export to Germany and four for export to England. Eight sets have also been shipped to the Middle West, and one set has been furnished a local concern.

The Department of Public Works, city of Philadelphia, is asking for proposals for two small structural steel bridges, one an arch foot bridge with stairway and approaches complete, some 72 ft. over all, at Duval street, over the Chestnut Hill branch of the Pennsylvania Railroad; the other comprising the widening of the Lincoln Drive bridge at Walnut lane. This latter includes the trussing of the present bridge, and adding to it two structural steel spans, 24 ft. 6 in. Specifications for these bridges may be obtained from the Bureau of Surveys, City Hall, and bids will be received until noon, November 8.

H. B. Underwood & Co. have recently shipped a large number of their special portable shop tools to railroad repair shops, as well as to individual concerns. Two portable boring bars and two rotary valve seat planing machines have been shipped for export and four two-cylinder steam or air motors for driving portable tools have been furnished different railroad companies. Orders for all their special tools are reported in good number, and all departments are exceedingly busy. In order to accommodate increasing business this firm has recently purchased a number of new machine tools, which when installed will increase the capacity of the plant 15 to 20 per cent.

The Standard Pressed Steel Company notes a constantly increasing demand for its American Pioneer pressed steel shaft hanger, from both foreign and domestic sources, and all depatments of the plant are actively engaged in meeting the demand. A large order for hangers was recently shipped to Switzerland and good sized orders for Holland and France delivery. The domestic trade recently has been made up of a large number of smaller orders from all sections of the country, and from the inquiries received the outlook for prospective business is very satisfactory.

The Philadelphia Roll & Machine Company is busy in all departments. Orders for rolling mill machinery as well as rolls for iron and steel mills, brass, copper and rubber rolling have been numerous, one recent order including a number of rolls for structural and rail mills for November and December delivery, of which a large number of the rolls weighed 25,000 lb. each. In addition to the above a number of orders for engine beds and special machinery castings, all of charcoal air furnace iron, have been received, and sufficient business is in hand to keep the plant actively engaged for a long time.

The Newton Machine Tool Works, Incorporated, is busy in every department. Orders for a large number of tools are on the books, sufficient to keep the plant well occupied for some time, while from the nature of inquiries received the outlook for business during the remainder of the year is considered very promising. Among some of the recent orders received were a number for heavy special tools, including five slotters of 48, 60, and 90 in. stroke, all equipped with pneumatic clutches; a number of crank drive slotters, slab and key seat milling machines, and combination Steel foundry and bar cold saw cutting off machines. Deliveries during October were very heavy, and include, among others, a number of keyseat milling machines, both for export and domestic delivery; three large special milling machines for a Western electric company; a two-spindle seat milling machine for a local concern; two portable boring machines for Western parties; an extra heavy 40-in. gear cutting machine for cutting street railroad motor gears, and a number of standard cold saw cutting off machines of various types.

New England Machinery Market.

WORCESTER, MASS., October 30, 1906.

The machine tool market in Boston and other New England cities sees no change, either in volume of demand or in deliveries. The tendency to advance prices still prevails, occasional notices of changes having been received by dealers during the week. Quite significant is a second advance within a fortnight by one of the large drill manufacturers. It is not believed, however, that this will prove other than an exceptional incident. The dealers certainly hope so, for most of them are outspoken in their disapproval of higher prices.

The machine tool builders, and, in fact, builders of all kinds of machinery, are noting with some anxiety the continued increase in the cost of everything that goes into their tools, and are particularly watching the pig iron market and its probable effect on the cost of castings. The recent advance in castings of one-quarter of a cent a pound will doubtless be followed by another after a little time. The foundrymen are genuinely worried about the pig iron situation, though one does not hear of cases where they have been caught in the rising market to any serious extent, although doubtless such instances exist. The foundries are now buying for the second quarter of next year at sharply increased prices, which probably means a corresponding advance in the price of castings later on.

Labor is getting more scarce. The unemployed skilled workman became a rarity months ago. Now it is difficult to get a desirable unskilled man. The best of them have been taken up, leaving only what may be termed the second and third grade of unskilled labor. The result is that machine shops are unable to increase their forces, and in many instances employers are hardly attempting to more than keep the present quota up to its limit.

The car shortage is affecting industrial New England, instances of late delivery being reported because the railroads were unable to handle the freight without delay. Manufacturers are watching the freight situation with a good deal of anxiety, for their deliveries, both of finished goods from the works and raw materials at the works, are bad enough as it is without this added source of annoyance.

The Central Vermont Railroad is adding to the equipment of its repair shops at St. Albans, Vt. It is understood that much of the machinery has already been purchased.

The Rivett Lathe Mfg. Company, Faneuil, Mass., successor to the Faneuil Watch Tool Company, is building a large addition to its shops, which will greatly increase the manufacturing facilities. Some of the new machinery has been purchased, but it is probable that other new tools will be required in the near future.

The equipment of the Cooley General Development Company, Green street, Jamaica Plain, will be sold at auction. The company has manufactured a rotary engine. It is presumed that the business will be suspended.

The Light, Heat & Power Company, 131 State street, Boston, is becoming an important factor in Central New England, in that it has acquired the electric lighting and power plants of a number of large towns and small cities, and, it is supposed, proposes to acquire still others. The apparent plan is to consolidate plants wherever it would be economical to do so. One such plan is already in process to establish a large power station which will provide electric light and power for the towns of Leominster, Clinton, Harvard, Ayer and Groton, all in Massachusetts, with a total population of close to 35,000 people and containing a considerable number of manufacturing industries. Doubtless the general scheme includes other new power stations or the development of some one existing station to provide light and power for a group of towns. There is great economy in a central station as compared to a number of small generating plants, and the change will not only put more money into the pockets of the owners, but should also tend to decrease the cost of the power to consumers.

The Ansonia Electrical Company, Ansonia, Conn., manufacturer of electrical goods, is planning the erection of a large addition to its works, to cost in the neighborhood of $30,000. Three separate plans have been prepared, each for an enlargement of the plant, but only one of these will be carried out at this time. The purpose is to increase manufacturing

capacity. No addition to the power plant will be made at present.

The Machinery Exchange, Boston, recently established in the Oliver Building, 10 Oliver street, is filled with tenants to the limit of present capacity, and the manager, Elroy N. Heath, is contemplating extending its scope by taking the larger store on the Milk street side of the same building and connecting it with the present store. There is a waiting list, and indications are that the additional space would soon be occupied. The present tenants are: H. B. Smith Machine Company, woodworking machinery, Elroy N. Heath, New England manager; Berlin Machine Works, woodworking machinery, Frederick A. Cheney, New England manager; Eastern Equipment Company, railroad and general contractors' supplies; Blaisdell Machinery Company, air compressors, C. H. Walker, New England manager; Bay State Supply Company, mill supplies, band and circular saws; Dey Time Register Company; Keystone Lubricating Company; F. C. Heath, grate bars for power boilers; Edge Moor Iron Company, water tube boilers, J. F. Foster, New England manager; Baldwin Steel Company, N. A. McLean; A. W. Godfrey, machine tools; Indestructible Fibre Company, S. H. Taylor, New England sales agent.

A great shoe factory to be erected at South Framingham, Mass., by Richard H. Long of that place may mean the establishment of a machine shop of considerable proportions. The shoe factory will be 63 x 490 ft. and five stories, of reinforced concrete. It will be equipped throughout with shoe machinery which can be bought outright, Mr. Long states. As this precludes the possibility of getting machines from the United Shoe Machinery Company, Boston, which puts out its entire product on lease, and as that company controls a great number of important patents, it is the expectation of Mr. Long that he will have to build a good deal of the machinery himself. He already has a shop which is devoted to this class of work. It is quite likely that a little later his machine shop facilities will have to be materially increased, in which case he will be in the market for machine tools.

The American Axe & Tool Company, Glassport, Pa., officially states that it will rebuild its plant at East Douglass, Mass., which was destroyed by fire October 17. Not all of the buildings of the company in that town were burned, but much of the works known as the Lower Village shops were destroyed, including the boiler house and tempering and grinding departments.

The Wilkinson Turbine Company, which will manufacture the Wilkinson steam turbines at the works of the American & British Mfg. Company, Providence, R. I., has completed its organization at a meeting recently held at New York. The directors are closely identified with the International Power Company, to which the new company will be subsidiary. Joseph H. Hoadley will be chairman of the Board of Directors. The other officers are: President, Edward K. Hill, Providence; vice-president, J. M. Dewberry, Birmingham, Ala.; treasurer, Alfred H. Hoadley, Providence, and secretary, E. C. Ott, New York. Preparations for the manufacture of the new turbine have been well advanced, and it is expected that the engine will be on the market in a comparatively short time. Tests have demonstrated to the inventor and to those interested financially that the turbine possesses features which will give it an important place in the field of power equipment.

The Confectioners' Machinery & Mfg. Company, Springfield, Mass., has acquired a large tract of land in that city, on the Boston & Maine Railroad, at the north end, with the intention of building a large plant on the premises. No plans have been made, however, and the new works will not be erected in the immediate future. The company does a large business, employing about 200 hands.

Cincinnati Machinery Market.

CINCINNATI, OHIO, October 30, 1906.

The shops without exception are crowded with orders and inquiry for new developments elicits the reply, "We have enough to do to keep within reasonable bounds with the work that is coming in without attempting anything out of the regular line." Dealers in second-hand machinery are finding it a difficult proposition to fill orders fast enough to satisfy the trade, and have little stock on hand. Reports indicate that this city is soon to lose the electric department of the Bullock plant, which is to be removed to Milwaukee about the first of the year. This will mean a great deal to a large number of employees as well as a great financial loss to this territory.

The Merchants' Ice & Cold Storage Company was incorporated at Columbus last week with a capital of $500,000 by B. A. Brinker, A. Bloom, George B. Riley, John F. Ankenbauer, F. Brogewisch and L. J. Oehler. An option has been secured on a piece of property on Eggleston avenue, where a cold storage plant will be erected with a capacity of 1,000,000 sq. ft. A complete equipment of new machinery will be installed when the building is complete, work on which, it is understood, will at once be started.

During the week J. C. Harron, representing the local machine tool manufacturers of San Francisco, visited Cincinnati and was entertained by several of the local manufacturers. It is understood that he was here securing a number of tools with which to equip shops that were damaged by the recent fire.

The Crawley Machinery Company, Newport, has doubled its floor space and correspondingly increased its machine tool equipment with the most up to date tools made.

The Federal Canning Machinery Company, Indianapolis, Ind., has been incorporated with $50,000 capital by John M. Paver, Jr., Walter A. Knight and Murat W. Hopkins, to manufacture machinery for canning, preserving, &c., under patents. The company will make particularly a can filler by first exhausting the air when the goods drop into can completely filling it. Other fillers now on the market operate by forcing the goods from a hopper by reciprocating plunger. An actual test shows great saving by this process over the old.

The Straub Machinery Company has been incorporated with a capital of $300,000, and will erect a large plant in Cumminsville. The company is now located at 1950 West Sixth street, Cincinnati, where it employs about 100 men. The new plant, which will be located at Knowlton street near Spring avenue, will consist of a machine shop about 500 ft. long and a foundry 200 ft. long, and will employ in the neighborhood of 400 men. In addition to these shops a complete electric power plant will be erected. This company now has a branch office in New York and ships a large amount of mill machinery to South American ports.

Cleveland Machinery Market.

CLEVELAND, OHIO, October 30, 1906.

Cleveland dealers and manufacturers are enjoying an unprecedented business. Many concerns are getting to a point where they are turning away business, which is almost forced upon them, as they cannot hope to fill the orders for months to come. Dealers complain that deliveries are constantly getting farther away, and the big stores have practically nothing on their floors. Customers seeking early delivery are willing to take almost anything in new or second-hand machinery that comes near to answering their requirements. Big premiums are being offered for new tools by concerns which are anxious to increase their equipments at once to take care of increased business. The dealers say that the business is general, and that few large orders are being placed. This is probably due to the fact that buyers are scattering their business and placing orders for two or three tools wherever they can secure promise of earliest deliveries on particular sizes. In every branch of the machinery business in this section one hears of numerous orders coming from automobile manufacturers; not only from all parts of this country, but from abroad. It was thought two or three months ago that the automobile makers had about finished buying for next season, as they could hardly get deliveries in time for early production, but new concerns are constantly coming into this field and are wanting machine tools just as quickly as they can get them. The commercial vehicle field is beginning to expand with great strides in this district. Many makers who heretofore have confined their efforts exclusively to the manufacture of pleasure vehicles are now taking up the commercial end of the business, a field which promises to be larger and much more stable than the other branch.

The demand for ore handling machinery continues to develop from new quarters. The Brown Hoisting Machinery Company, which is the leader in this particular field, reports that within the last three or four weeks it has closed up more large contracts than in any previous similar period in its history, most of it being for ore handling outfits for Great Lakes ports.

Government Purchases.

WASHINGTON, D. C., October 30, 1906.

The Isthmian Canal Commission will soon ask bids for two suction dredges, one to be delivered at Cristobal and the other at La Boca.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until November 20 for pumps, hydraulic jacks and a large quantity of other supplies for the Eastern navy yards.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until December 11 for the following machine tools for the Mare Island Navy Yard:

Schedule 245, electric traveling hoist, rotary blower; schedule 246, shaper, pipe cutters, drills, lathes, bolt cutter, grinder and planer.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until November 27 for the following machine tools for the New York Navy Yard: Schedule 241, tubular boiler; schedule 242, two turret lathes, three grinding machines; schedule 243, one emery grinder, one blue printing machine; schedule 244, one spindle drill and one pipe cutting machine.

The following bids were opened October 23 for supplies for the navy yards:

Bidder 30, Brooklyn Forge & Supply Company, New York; 32, George F. Blake Mfg. Company, New York; 39, F. S. Banks & Co., New York; 44, James B. Clow & Son, Chicago, Ill.; 50, Chandler & Farquhar Company, Boston, Mass.; 51, Chicago Pneumatic Tool Company, New York; 56, Cuyler & Mohler, Baltimore, Md.; 74, Fairbanks Company, Baltimore, Md.; 83, R. W. Geldart, New York; 92, Hisey-Wolf Machine Company, Chicago, Ill.; 94, Handlan-Buck Mfg. Company, St. Louis, Mo.; 105, Independent Pneumatic Tool Company, Chicago, Ill.; 117, Montgomery & Co., New York; 120, Manning, Maxwell & Moore, New York; 121, Manhattan Supply Company, New York; 145, J. Edward Ogden Company, New York; 185, Sherman-Brown-Clements Company, New York; 199, United Engineering & Foundry Company, Pittsburgh, Pa.; 203, Vermilye & Power, New York; 210, Western Electric Company, New York.

Class 3. One water tapping machine—Bidder 39, $149.50; 44, $115; 56, $190; 120, $130; 121, $220.

Class 22. One vertical duplex steam pump—Bidder 32, $45; 39, $75; 145, $81.89; 203, $94.90.

Class 91. One portable electric breast drill, two portable electric grinders—Bidder 30, $177; 50, $177; 83, $177; 92, $177, $117, $148.40; 120, $177; 121, $177; 185, $177; 210, $177.

Class 92. One squaring shear—Bidder 74, $700 and $850; 94, $700; 199, $875.

Class 93. Six nonreversible air drills—Bidder 51, $300; 105, $322.50.

Bids were opened October 23 as follows for machinery for the Isthmian Canal Commission, Circular No. 334:

Bidder 9, Bertsch & Co., Cambridge City, Ind.; 23, Drew Machinery Agency, Manchester, N. H.; 30, Fox Bros. & Co., New York; 32, Handlan-Buck Mfg. Company, St. Louis, Mo.; 45, Manning, Maxwell & Moore, New York; 48, Motley, Green & Co., New York; 51, Niles-Bement-Pond Company, New York; 54, C. T. Patterson Company, New Orleans, La.; 56, Prentiss Tool & Supply Company, New York; 57, Queen City Supply Company, Cincinnati, Ohio; 60, Ricketts Engineering Company, Washington, D. C.; 78, Vermilye & Power, New York.

Class 10. One twist drill grinder and five carborundum wheels for machine—Bidder 30, $100.77, 35 days; 45, $109.22, 90 days; 48, $125, 40 days; 57, part item 28 only, $125, no time; 60, $109, 30 days.

Class 11. Two back geared pillar crank shapers—Bidder 30, $1186, 130 days; 45, $1173.70, 150 days; 48, $900, 175 days; 51, $1300, 84 days; 54, $1137.40, 90 days; 56, no bids; 60, $1196, 22 days.

Class 12. One set horizontal bending rolls—Bidder 9, $925 and $960, 30 days; 23, $1500, 100 days; 30, $1399, 85 days; 32, $965, 40 days; 45, $1257.15, 150 days; 51, $1630, 90 days; 78, $629.50 and $659.50, 60 days.

Class 14. One combination band, rip and resaw machine and three saw blades—Bidder 30, $772.95, 21 days; 32, $786, 40 days; 45, $792.52, 70 days; 78, $804.85, 60 days.

The following bids were opened October 23 for 10 earth spreaders for the Isthmian Canal Commission:

Oswald F. Jordon, Chicago, Ill., $57,000, f.o.b. Colon; $49,500, f.o.b. Harvey, Ill.; time, 110 to 140 days.

Mann-McCann Company, Chicago, Ill., $67,700; delivery at Colon, 160 to 200 days.

Wm. J. Oliver Mfg. Company, Knoxville, Tenn., $49,500; delivery at Colon, time, 120 to 200 days.

The following awards have been made for machinery for the navy yards, bids for which were opened September 25:

H. B. Smith Machine Company, Smithville, N. J., class 31, machinery for carpenter shop, $2631.20.

Prentiss Tool & Supply Company, New York, class 41, one horizontal boring and drilling machine, $2698; class 45, one precision bench lathe, $1100.

Manning, Maxwell & Moore, New York, class 42, one universal radial drilling machine, $1575; class 43, one extension gap engine lathe, $1925.

Niles-Bement-Pond Company, New York class 44, one engine lathe, $1530.

Frevert Machinery Company, New York, class 49, one tool grinding machine, $220.

Drew Machinery Agency, Manchester, N. H., class 50, one automatic planer, knife grinder, $85; class 48, one automatic band saw setter, $32.50.

Brooklyn Forge & Supply Company, New York, class 51, one hand power hydraulic bar straightener, $597.40.

B. F. Sturtevant Company, Hyde Park, Mass., class 119, one generating set and spare parts, $676.30.

Armor Plate and Projectiles.

A paper discussing the manufacture and properties of armor plate and of modern projectiles was read before the engineering section of the British Association for the Advancement of Science at York, Eng., by Brevet Major Edwards, R. A. He pointed out that since 1861, when both England and France had armored seagoing squadrons afloat, the progress in the use of armor plate has been almost continuous. Increased thickness and resistance of the armor plates have been constantly met by increasing the penetrating power of the gun and the contest between the two is continuous. A detailed account was given of the process of manufacturing armor plate now followed at the Krupp Works. The following is a typical analysis of the steel used: Ni., 3.50 per cent.; Cr., 1.50 per cent.; C., .30 per cent.; Mn., .70 per cent.; Fe., 94.0 per cent.

The heat treatment of these nickel chrome steels in the manufacture of armor plate is long and complicated, and great care has to be taken in certain stages of the manufacture that definite limits of temperature are not exceeded. According to the author the majority of modern armor plates are made under the Krupp license. By recent improvements in the Krupp process the "cementation," or superficial carbonizing of one side of the plate, can now be carried out with plates under 5 in. in thickness, and also with the curved plates used for casements. One of the chief features in the Krupp process is the care taken in the thermal treatment, recording pyrometers being used during the cementation process, which lasts one month, to insure that the correct temperature is maintained. As between forged and cast steel armor, the lower cost of the latter, due to its much quicker manufacture, is an important point in its favor. The amount of work put into and time required for the highest class of forged steel armor plate raises the value of the latter to about £100 per ton, and the armor used for protecting a modern battleship was stated to amount to nearly one-half its total cost.

In dealing with projectiles the paper described them as of specially hardened and tempered steel containing chromium and usually nickel, while molybdenum is sometimes used. Referring to the introduction of capping to increase the penetrating power of the shell it was stated that capped armor piercing shell of modern type are, as a rule, capable of perforating intact a Krupp cemented plate of a thickness equivalent to their caliber, at a velocity of from 1800 to 1900 foot-seconds. Uncapped armor piercing shot require a considerably higher velocity to defeat a similar plate, and their action is a punching and not a perforating one where hard faced plates are concerned. Armor yields to the attack of the shell in three ways. It may be fractured and broken up without being perforated, as in the case of chilled iron armor. It may be perforated or bored, as in the case of a relatively soft plate such as wrought iron, when overmatched by a pointed projectile. It may yield by a plug or, more usually, a large coned disk being punched out of it. This is the manner in which the modern hard faced plate most often yields when overmatched, and may be looked upon as intermediate in character between the extremes of boring and smashing, but approaching the former rather than the latter.

The paper discussed the theory of capping, with a prophecy that in the future two thicknesses of armor only would be found on battleships—that capable of stopping heavy armor piercing shell at medium ranges and that able to keep out high explosive common shell of 6 in. or less caliber. Professor Ewing, in commenting on the paper, gave an explanation of the action of the cap in preserving the conical form of the nose of the projectile, on first meeting the face of the plate against which it is fired. The softness of the metal used for the cap is an essential condition of its effectiveness, for it at once assumes the form of a fluid supporting ring around the striking tip of the shell and prevents the deformation or crushing in of the nose of the shell which otherwise would occur.

Trade Publications.

Air Compressors.—Chicago Pneumatic Tool Company, Fisher Building, Chicago, and 95 Liberty street, New York. Booklet. Contains a list of users of Franklin air compressors throughout the world, these being arranged geographically by countries, States, towns and users, and alphabetically, with the number installed where it exceeds one. The principal object is to acquaint prospective purchasers with the various installations in their localities so that they may investigate them at their convenience.

Kerosene Engines.—International Power Vehicle Company, Stamford, Conn. Deals with International kerosene engines, ranging from 1½ to 20 hp., and reversing gears, in sizes of from 2½ to 20 hp. An engine with a pump jack attachment and a 5-hp. hoisting engine are also included, and a price-list and table of sizes, weights and dimensions is appended.

Electrical Apparatus.—General Electric Company, Schenectady, N. Y. Bulletins, flyers and catalogue. Bulletin No. 4441, superseding No. 4400, deals with type H subway transformers for standard voltages, in sizes from 5 to 200 kw. Bulletin No. 4442 refers to the GE-87 railway motor, which is somewhat similar to the GE-57 motor. No. 4444 refers to direct current motor driven air compressors of the gear type; No. 4445 to direct current Curtis steam turbine generators of the horizontal type, and No. 4448 to small polyphase motors made in sizes up to 7½ hp. Flyer No. 2189 describes the various uses of the Edison reflector lamps. Flyer No. 2185 pertains to the G. E. molding rosette, and No. 2190 to cast grid field rheostats, type F, form S, for 60 and 125-volt circuits. Supply catalogue No. 7598 lists the parts of the plain type carbon feed inclosed arc lamps. Price-list No. 5151 lists National electrical code standard and old code inclosed fuses and cutouts, and No. 5152 the Gem regular incandescent units and Gem meridian units.

Windmills.—The Valley Wind Engine & Iron Company, Limited, Bay City, Mich., the sole manufacturer in the United States of the line of goods made by the Goold, Shapley & Muir Company, Limited, Brantford, Canada. Catalogue No. 5. Illustrates and describes the Garland windmills, which are claimed to possess many novel features. Towers, grinders, pumps, cream separators, &c., are also included.

Steel Plate Construction.—William B. Pollock Company, Youngstown, Ohio. Supplementary catalogue No. 4. Contains photographs of the No. 2 Gadsden Furnace, which was recently built by the company for the Alabama Consolidated Coal & Iron Company, Birmingham, Ala.

Metal Working Machinery.—Cincinnati Punch & Shear Company. Catalogue. Size, 6 x 9 in.; pages, 55. Deals with power punching and shearing machinery and bending and straightening rolls. Illustrations and descriptive matter of these machines are given and also a table of sizes of the company's standard tools.

Steam Pumps.—American Steam Pump Company, Battle Creek, Mich. Catalogue. Pertains to the Marsh boiler feed pumps for various pressures and capacities. The operation is explained and tables of dimensions and capacities are given.

Second-Hand Metal Working Machinery.—Niles-Bement-Pond Company, 111 Broadway, New York City. List No. 12. Gives particulars concerning a number of second-hand tools coming under the classifications of railroad machinery, screw cutting lathes, speed lathes, lathes not screw cutting, brass finishers' lathes, chucking machines and turret head, plain and wire feed screw machines; planers, shapers, drills, bolt and nut machinery, cutting off and centering machines, tapping machines, milling machines, boring machines, punch presses, shears, &c.; grinding and polishing machines, woodworking machinery and miscellaneous machinery.

Engine Governors.—Pickering Governor Company, Portland, Conn. Catalogue No. 19-6. The Pickering governor, now some 44 years old, is distinctive in that it has no joints, the governor mechanism acting directly on the valve, as a consequence of which an especially close regulation is claimed. The catalogue describes the principles of the governor, illustrates the numerous types, giving also tables showing the sizes in which the different types are made. Class A governors are fitted with automatic safety stops, spring speeder and sawyers' lever. Class B governors are adapted for all styles of engines and are made in the horizontal as well as vertical form. When desired the governors are furnished in combination with a stop valve, this being a combination brought out a few years ago. There are also illustrations of governors equipped with Pickering speed rangers, by which an unusually wide range of speed can readily be obtained. This device was patented only this year.

Steam Traps.—The Joseph Dixon Crucible Company, Jersey City, N. J. Pamphlet on the subject of steam traps. An illustrated description of several varieties, with valuable suggestions by W. H. Wakeman, expert steam engineer and author of well-known books on steam engineering. This pamphlet is a reprint from *Graphite* and is well worth careful reading, for it is instructive as well as interesting.

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HARDWARE

AN interesting feature of the meeting at Atlantic City was the report made by the chairman of the Joint Catalogue House Committee. In this report, which was in the form of an address, a review was given of the work of the committee, presenting in an attractive form and manner the facts of which our readers have been kept advised. The unquestioned good that has been accomplished, as some lines of well-known goods which sell largely on the reputation of the maker's name have been withdrawn from sale through these channels, and advanced prices in some cases announced by the catalogue houses on the far greater number of articles which continue thus to be sold, was pointed out clearly and forcibly. While much more attention was naturally bestowed on the manufacturers than on the jobbers as sources of supply for the mail order houses, there were significant references to merchants, both wholesale and retail, as channels through whom these houses are enabled to procure their goods, and a suggestive side light was thus let in on the difficulties which attend any plan which aims at the shutting off of goods from these houses. When it is remembered that there are in the country approximately a thousand jobbing houses, that is, houses which are by associations of manufacturers accorded jobbing prices, though many of them, like some of their larger compeers in the jobbing field, do a combined wholesale and retail business, it is obvious that there are a great many subterranean ways by which goods may reach forbidden destinations and disturbing distributers. It is doubtful if the committee recognizes adequately the importance of these channels of supply.

The announcement that the committee is about to print and lay before the trade information in regard to the attitude of manufacturers, and perhaps of jobbers, is of some interest. The trade, recalling that a similar announcement was made some time ago and for some reason the plan abandoned, are naturally wondering whether or not the project will at this time materialize. Reference was made in the committee's report to the fact that some manufacturers and some jobbers who have openly professed to be among the opponents of the catalogue houses, while secretly supplying them with goods, as suggesting a serious practical difficulty. With the apprehension of being reported unfavorably by the committee, and in such a way as probably to injure his standing with the trade, is there not danger that the temptation to express himself as the committee would like to have him express himself may lead some weak brother, be he jobber or manufacturer, to profess to accede to the views of the committee, but with mental reservations, or in an absent minded manner, as though he were thinking of some indirect channel through which his goods may reach Chicago or other center of catalogue house distribution? To some this aspect of the project will look like putting a premium on disingenuousness, not to use a shorter and blunter word.

If there are difficulties in covering and reporting the conduct of jobbers, whether they be entimated as 500 or 1000 in number, what is to be said of the practicability of getting on record, accurately and fairly, the tens of thousands of manufacturers who make goods such as are sold by Hardware merchants and by the catalogue houses—or are a few to be singled out and the rest, the greater number, be permitted to go scot free? The committee is evidently taking upon itself a huge task.

Condition of Trade.

Advances in goods are taking place almost too constantly and rapidly when the permanent welfare of the trade is considered. Such action is indeed as a rule taken conservatively and under the pressure of conditions which seem to require it. When raw material advances and labor demands higher remuneration, with the cost indeed of producing goods steadily increasing, prices must, under the laws of trade, reflect the uplifting influences. The advances which are announced are in practically all cases moderate and reasonable, and the goods at the higher range of quotations are still clamored for by the merchants through whose stores and warehouses they pass into consumption, being readily absorbed by the public, whose general prosperity is the secret of the existing great volume of business. October closes with a fine record and November will open with the producing, carrying and distributing facilities of the country in full operation. Delays in shipments do not diminish, and complaints are frequently heard of inadequacy of supply of raw material to the manufacturers and of goods to the merchants. With the coming of cold weather season goods are in active movement from the retailers' stores, some of whom, belated in their purchasing, are calling upon the jobbers for supply. Holiday goods and fancy articles are being handled to an increasing extent by the Hardwaremen of the country, and at this time there is a noticeable activity in such lines. The situation in Builders' Hardware does not seem to improve much, as manufacturers are far behind their orders. Enterprise throughout the country gives no evidence of lagging, and structures of all kinds are giving employment to laborers and mechanics, using up building materials and making place for the extensive varieties and large quantities of Hardware which enter into them. Collections are more difficult than usual and some complaint is heard on this score. Foreign trade continues to increase in volume.

Chicago.

The inclement weather which has prevailed throughout the West and Northwest during the past 10 days has accentuated the demand for winter goods and heavy shipments are now going forward to the retail trade from jobbers' stocks. The early movement of many lines which in previous years were deferred to November, has swelled the volume of business for October, and the indications are that the books of the largest jobbers will show totals considerably in excess of those of September. Holiday goods are likewise beginning to move, and the decline in the demand for such lines as are used extensively in building operations has been more than overcome by the heavy purchases for the holiday season and the winter trade. It is now reliably reported that an understanding has been reached by the manufacturers of Wire Cloth, and that the schedule of 1907 prices can be expected about the middle of November. With probably one exception none of the manufacturers has made any sales into next year and all contracts will therefore be on the new basis, which will be rigidly maintained by all the makers. As yet there has been no change in the quotations on Fine Wire and the probabilities are that the

Wire mills will permit the basis to remain undisturbed. Advances on mill prices of Sheets announced Thursday, October 25, by the American Sheet & Tin Plate Company follow: Blue Annealed, $1; Box Annealed and Galvanized, $2; Painted Corrugated Roofing, 10 cents and Galvanized, 5 cents. Tin Plate was marked up 15 cents a box and Terne Plate 10 cents. Store prices of both Black and Galvanized Sheets have been advanced $2, making 28 gauge, Black, $2.95 and Galvanized, $4. The manufacturers of Sheet Zinc have likewise advanced their list 15 cents per 100 lb. Local Heavy Hardware jobbers are now asking $2.25 per 100 lb. for Iron Bars from stock and on Steel Bars they are quoting $2. The volume of new business placed with the leading manufacturers of Wire Nails during October compares favorably with September tonnage and almost equals the total of that record month. The production of Wire products, however, shows only a slight increase, the steel shortage curtailing the output.

Philadelphia.

SUPPLEE HARDWARE COMPANY—Trade continues without any interruption to its activity. The many recent advances in manufacturers' prices have caused a feeling on the part of some of the retail merchants that they would be unable to extend at once these advances in sales to their customers, but there is no other alternative but to comply with the actual necessities of the case.

Both the scarcity and rapidly increased cost of raw material undoubtedly causes additional advances by manufacturers and this extends to various kinds of goods. The actual increased expense of manufacturers caused both by the scarcity of labor and advances in wages is greater than the average dealer would think, but we are up against it. The prosperity of the country is not always a signal to all living men, women and children that they will all profit by it at once, but we feel the retail Hardware trade cannot afford to let their stock run down for fear of a decline in prices by manufacturers. The jobbers must naturally run a greater risk than the retail merchants for their stock must be kept up in as good condition as possible in order to supply urgent demands from customers who must be ready to supply their customers or lose trade.

A continued scarcity of crude Iron, Steel, Pig Iron and many kinds of material is reported. The country is suffering from a freight car shortage caused by the heavy demands upon the railroads beyond their present possibilities, which causes considerable complaint, but the boy exclaimed, "let me alone; I will get out of this hole soon, and you will see I have profited by experience."

It is but natural that there may be some unnecessary advances owing to quick conclusions to arrive at the extra cost, which is often difficult to manufacturers, but we cannot help it. Attend to business and take all the advantage of the present prosperous condition of the country possible.

We are sorry to say, largely owing to the money used in handling the products of the country as well as the advance in money rates, collections are not equal to what we would like to see them.

Boston.

BIGELOW & DOWSE COMPANY—When manufacturers of a certain line tell us to double the old list and quote a discount from the result it brings back memories of the time when the premium on gold was advancing daily, and we were paying more to replace our stock month after month than we had sold the same goods for the previous month. There is no question but the manufacturers are now having their innings, and can make prices at their own sweet will, while the jobbers beg and implore attention to their orders. Stocks of Hardware in store are at a premium and are hard to replace.

Conditions warrant higher prices, and in many lines they are forced upon the manufacturers on account of the advance in raw material. It is a question if general Hardware prices have advanced enough to cover the higher cost of material and labor and if the manufacturers could make a profit if they were obliged to purchase their raw material at to-day's prices.

It is in these times that we appreciate the action of the United States Steel Corporation, which holds the market in check and whose conservative policy rules the situation. Usually under present conditions the market would go wild, leaving all to suffer at a later time. Thus far the advances seem not excessive and one may safely buy at present prices.

The great crops will be marketed at high prices this fall, which seems to insure a large business for the coming year. Every dealer is warranted in carrying a full stock and in keeping it full for the first six months of 1907 at the least. Every one is busy, and New England retailers appreciate present conditions. It does not seem likely that politics can have much influence on present conditions, whatever may be the result of the coming elections so near at hand. Everything looks bright and prosperous as we view the situation.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—Now that all the "bosses" have returned from the conventions at Atlantic City matters are beginning to resume their usual aspect and things are moving along in their accustomed channels.

The conventions of both manufacturers and jobbers this year must have been veritable love feasts, as from all accounts everyone was enjoying a large degree of prosperity in their business, and when this is the case conventions are most enjoyable affairs as each one can overlook the little peccadilloes of his neighbors and extend the right hand of fellowship.

The situation in the Hardware business is gradually and steadily getting "tighter." The scarcity of goods is somewhat more pronounced, the demand is keeping up and in fact improving, and the latter months of the year promise to be the best.

With all the scarcity of goods and the steady and many advances along almost every line, there are still some feeble minded salesmen who insist that they have to cut prices. Isn't it awful, when a time like this comes only once in twenty years, that anybody should think of slaughtering the price of goods!

Reports from all sections of the country indicate a splendid condition, and even in the storm swept South the majority of the people have waked up and found they were not nearly so badly injured as they had thought.

We are preparing for a very busy period between now and the first of the year and look for no chance to loaf during the spring trade, as everything points to a very heavy business. Let us all "make hay while the sun shines."

Cleveland.

THE W. BINGHAM COMPANY.—The condition of trade in this section is exceedingly good. We believe there never was such a demand for the general line of Hardware in all its branches, mining, milling and manufacturers' supplies, Builders' Hardware, Mechanics' Tools and House Furnishing Goods as there is at the present time and has been for the last 60 days. Everybody is in a hurry and everybody wants to be waited on first, but that of course cannot be done. Customers must be patient and their orders will be filled in their turn as rapidly as possible, consistent with good service.

There are many items on different lines of goods of which the manufacturers are short. While they have been ordered, some are in transit from the factories; the railroads are slow in deliveries and it takes a lot of time to get some goods. If customers had taken our advice early (which a great many of them did and are doing now), *viz.*, buy goods in larger quantities and in advance of their immediate wants, there would not be so much telegraphing necessary or so many letters written requesting different jobbers to hurry up goods that they want immediately.

Stocks among the Cleveland jobbers are large at present, and they are prepared now, as they have been in the past, to take care of customers as rapidly as any one

could or should reasonably expect. On account of the large stocks that are carried here we are getting orders from sections of the country that are not strictly tributary to this market, because buyers know that if they can get the goods at all this is the market to buy them in.

We remember an expression that an old German Hardware merchant over in Indiana used about 30 years ago. He wanted some odd article in the Hardware line, and his brother asked him from whom he was going to order it. He said, "he was going to get it from Bing-man of Cleveland." His brother said, "Louie, do you think Bing-man has got it?" He said, "Yes, Bing-man, he got everyt'ings in the Hardware line."

The manufacturers of many lines of goods are obliged to revise their prices. A great many manufactured articles are scarce, and there does not seem to be enough raw material on hand to supply the manufacturers promptly. Therefore they must adjust the prices to suit the times.

There are many goods in the Hardware line that are very cheap at present prices, and the trade would do well to load up on them, *viz.*, Cast, Malleable and Brass Fittings, Steel and Iron Merchant Pipe, Carriage, Tire, Machine and Stove Bolts and Lag Screws, Brass and Iron Flat Head and Round Head Screws, Nuts and Washers, Files, Carpenters' Tools, Sand and Emery Paper, Plain, Retinned and Enameled Ware, Sad Irons, Platform Scales, Bright Tin Plate, Leaded Roofing Plate, Eave Trough, Conductor Pipe, Galvanized Black Sheets, Galvanized Pails, Tubs, Ash and Garbage Cans, Coal Hods, Cast Iron and Porcelain Lined Sinks, Set Length and Pitcher Spout Pumps, Crow Bars, Sledges, Picks and Mattocks, Stove Pipe Elbows, Made-up Stove Pipe, Shovels, Spades and Scoops and many other goods.

Get under cover at once on Shovels, Spades and Scoops. These goods of the standard makes, such as are sold in this market, are extremely low at the present time. We would advise the trade to take them into stock at once at the prices you are able to obtain from your jobbing friends. Don't put it off. You will pay more money undoubtedly for these goods later and run a chance of not getting them when you want them. Buy them now and carry them over into next season; they are good property.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—The month of October closes with very satisfacory results as to volume of business transacted. The consumption of goods grows still heavier as the season advances, confirming our predictions given in former reports. The commercial as well as the producing communities regard the future of trade with the utmost confidence. Large crops this season, together with substantial values obtained for everything the agriculturist produces, are a sure basis on which to predict the future course of business for a reasonable time ahead. The financial condition of the Trans-Missouri region remains on a substantial basis, which will be likely to continue until the future of next year's crops can be ascertained.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—The iron and steel market still continues its triumphal march. It is evident that this country has not been able to produce raw material fast enough, since the definite news of purchases of pig on the other side for immediate delivery has been published far and wide. In the olden times this mere announcement of any foreign pig coming into our ports would have given the manufacturers and dealers a night-mare, but now we look on incoming cargoes as very pleasant help in time of need. According to all accounts the Middlesboro Iron and Scotch Warrants are higher than they have been since '01. Advances everywhere seem to be the order of the day.

Collections seem to be improving as the cotton crop is marketed, and are running somewhat ahead of last year. The full prices obtained for the magnificent crop is something that brings gladness to every Southern heart. It is impossible for the people of the Gulf States to look cheerful when cotton is on the decline, their smiles go on with the bale ties. Wheat producing regions too, seem to have abundant means to pay their debts.

As the holiday season approaches, there is the movement of goods which pertain especially to that time of the year. The Toy Wagons, Sleds, &c., are all going somewhat, although what frost there was on the pumpkin for one or two nights has long since disappeared. Persimmons are ripe, and beechnuts are raining down from the trees for the benefit of girls, boys and bacon. Altogether it is a beautiful season and we have much to be thankful for. We cannot get all of the Stoves we want or other seasonable goods, but we can be thankful that our coal beds are made upon a liberal scale and our iron beds are not limited to any small area of our country, but are well scattered North and South. Alabama is not frozen up even if Minnesota may be in the middle of the winter, and mining operations go on just the same. If metals keep on appreciating some future enterprising company will dredge up the Cuban arms that Secretary Taft has let go thirty fathoms down. We cannot quite reconcile that very palpable waste with our notions of economic properties. The furnace and the rolling mill would have shaped them into I-beams or plow shares. As it is they simply line the bottom of the already overfed sea.

Portland, Oregon.

FAILING, HAINES & MCCALMAN.—We suppose that our letters have considerable sameness, but as usual there is nothing to report except a continuance of the prosperous condition which we have reported ever since we first began under the new firm name. Our experience has been, and from conversation with other jobbers we learn that it is common to all of them, that if we could get the goods we could increase our sales greatly. Our traveling men report that prosperous conditions bid fair to continue throughout the Pacific Northwest indefinitely. New firms are starting up, new manufacturing enterprises are coming in, and yet it seems that the great natural advantages of this country have been barely touched. There is no territory in the United States which offers so great advantages to any man with or without capital, who wishes to start in life. There are few or no labor troubles outside of Portland. Wages are good; in fact, especially so, and there is every opportunity for every man to establish himself. The great need of the country is more men of industry, enterprise and a little capital.

Railroad building continues and new extensions of existing lines are announced almost every day. Should only a small proportion of these proposed lines be built they will open up a practically undeveloped section of exceedingly rich territory; in fact, the largest undeveloped fertile territory as yet remaining in the United States. With all these favorable prospects we see no reason to fear for business development in this territory in the immediate future. Collections are good, and apparently everybody has money enough to buy all the goods he can get.

Baltimore.

CARLIN & FULTON.—After an exchange of experiences and opinions among those who attended the late conventions at Atlantic City it seemed unanimously conceded that never in the history of the trade has there been a more general distribution of business activity than now among all classes—manufacturers, jobbers and retailers—and it is also evident that the demand for goods is legitimate and not at all speculative.

There is undoubtedly great satisfaction in an active market, and yet at present business is done under many disadvantages. Manufacturers complain of scarcity of raw material, the slow deliveries on old contracts and the necessity of frequently paying premiums for prompt deliveries. They also complain of the scarcity of labor and of the lack of transportation facilities. Jobbers consequently suffer from delayed and incomplete shipments, while the retailer has also his troubles of a similar nature.

Repeated advances in Steel, Iron, Copper and other metals, also in Leather and other commodities, and the

higher prices of labor, are all being reflected almost daily in the withdrawal of old prices by many manufacturers and the announcement of higher quotations.

As yet these changes are not radical, but are being made most conservatively. It is undoubtedly in the power of many of the manufacturers to arbitrarily put much higher prices on their products, but they seem generally to be pursuing a wise course in keeping their advances within reason, though we do not believe that prices have yet reached their maximum. Even should the market remain stationary there is hardly a possibility of any declines, but undoubtedly delays will occur in shipments on contracts, and it is good policy for the trade to have their orders in for shipment even before the actual time that the goods may be needed for consumption.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—We are glad to report that the Hardware business in this section continues most satisfactory. Salesmen on the road are sending in large, well assorted orders. Mail orders are plentiful. The market is very firm and prices are being advanced daily. Sales for October will probably run from 20 to 25 per cent. ahead of last year.

The injury that was reported to have been done in the South by the recent storms has been greatly exaggerated, and the South as a whole was never in better condition than it is at present. The cotton crop is going to be large, and the price is high enough to bring a great deal of money to the Southern people.

The movement of midwinter goods is quite heavy now. All of the jobbers are shipping out great quantities of Stoves, Coal Hods, Fireplace Goods, Stove Pipe, &c. The retail dealers are buying liberally of holiday goods and are evidently anticipating a big holiday trade. Collections are very satisfactory.

NOTES ON PRICES.

Wire Nails.—New business placed during October compares favorably in volume with that of the previous month. The shortage of Steel and scarcity of labor has interfered with the normal production, and mills are still somewhat behind on deliveries. Scarcity of cars and the congested condition of the railways also delay prompt receipt of Nails and keep jobbers' stocks at low ebb. In some cases premiums over official prices are asked for Nails by the smaller mills, who are dependent upon outside sources for rods, because of delay in getting them and higher prices. The market is very firm. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers	$1.85
Carload lots to retail merchants	1.90

New York.—Demand is excellent and jobbers are receiving shipments from mill more promptly, although delays occur from the inability of railways to keep cars moving from shipping point to destination. New York quotations on small lots at store are on the basis of $2.05 per keg.

Chicago.—Notwithstanding the enforcement of the official schedule and the withdrawal of concessions of $1 a ton which were made to the trade practically the entire year, the new tonnage for October almost equals that placed with the mills during the previous month. Production has shown only a slight increase despite the favorable operating conditions, owing to the Steel shortage, which is greatly below the requirements of the Steel mills. Shipments are still deferred from two to three weeks, and with goods delayed in transit distributers are experiencing great difficulty in maintaining stocks. Official quotations, which are being firmly maintained, are as follows: $2 in car lots to jobbers and $2.05 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—The volume of new business in Wire Nails is not as heavy as it was prior to the advance in prices, but specifications on contracts are coming in very freely and the mills are still considerably behind in deliveries. The continued scarcity of Steel and labor prevents the mills from getting out normal production and from catching up on deliveries. The smaller mills that are dependent on outside sources for Rods are unable to get prompt deliveries and are paying higher prices, and for this reason sometimes ask premiums over official prices for Wire Nails. The market is firm, and we are advised that official quotations are being maintained. We quote: Wire Nails, $1.85 in carloads to the large jobbing trade, and $1.90 in carloads to retail merchants, f.o.b. Pittsburgh, plus actual freight to point of delivery, terms 60 days, less 2 per cent. off for cash in 10 days. The above prices are now absolute minimum of the market.

Cut Nails.—A meeting of the Cut Nail Association was held to-day (Wednesday). It was decided to make no change in the price of Nails. Shortage of Steel and labor, scarcity of cars and the slow movement of freight prevent mills from making prompt deliveries. Jobbers' stocks are particularly short on 8, 10 and 20 penny Nails, the sizes most in demand. The market is very firm and premiums of 10 to 15 cents per keg above regular quotations are sometimes paid to secure anything like prompt deliveries. Quotations are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, $1.90; less than carloads, to jobbers, $1.95; less than carloads, to retailers, $2.05. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 10 cents advance on Steel Cut Nails.

New York.—The scarcity continues, and jobbers are particularly short on sizes and kinds most in demand. Scarcity of steel and labor and the slow movement of cars from mill all contribute to aggravate the situation. Demand is active and quotations for small lots at store are on the basis of $2.05 per keg, with $2.10 occasionally asked.

Chicago.—The tonnage taken during October has been very heavy and demand still continues beyond the ability of mills to supply. Local distributers have booked an exceedingly large tonnage during the month, despite conditions which have hindered their getting deliveries. Quotations prevail as follows: Steel Cut Nails, in car lots, $1.95 to $2; less than car lots, $2.05; Iron Cut Nails, $2.05 to $2.10, in car lots; less than car lots, $2.15.

Pittsburgh.—The continued shortage in steel and in supply of cars prevents the Cut Nail mills from making prompt deliveries, especially on sizes usually called for, these being 8 and 10 penny. Prices are very firm, and the two mills in the Wheeling District are holding firmly at $2 a keg, f.o.b. Pittsburgh, and in some cases higher prices are asked. Official prices, on which, however, premiums of 10 to 15 cents per keg are being paid for prompt deliveries, are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, $1.90; less than carloads, to jobbers, $1.95; less than carloads, to retailers, $2.05. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 5 and 10 cents advance on Steel Cut Nails.

Barb Wire.—Owing to the lateness of the season the placing of new business is limited, although specifications on contract orders are being freely received by the mills. The market is firm. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots	$2.00	$2.30
Retailers, carload lots	2.05	2.35
Retailers, less than carload lots	2.15	2.45

Chicago.—New tonnage is light, although specifications are exceedingly satisfactory, the season considered. Stocks are generally reported very low, the mills running much lighter than is customary at this time of year. Prices, which are firmly maintained, are as follows: To jobbers, Chicago, car lots, Painted, $2.15; Galvanized, $2.45; to retailers, car lots, Painted, $2.20; Galvanized, $2.50; retailers, less than car lots, Painted, $2.30; Galvanized, $2.60; Staples, Bright, in car lots, $2.10; Galvanized, $2.40; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The advanced season is causing the usual falling off in demand, but specifications on contracts are still coming in freely. The mills, however, are

making better deliveries, and are pretty well caught up on back orders. Prices are being firmly maintained, as follows: Painted Barb Wire, $2, and Galvanized $2.30, in carload lots to the large jobbing trade, with the usual advance of $1 a ton to retailers in carload lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in 10 days.

Smooth Fence Wire.—Production is not equal to the demand for manufacturing purposes, and mills are far behind on deliveries. In some cases contracts extend into the new year. Shipments are delayed by shortage of steel and cars. Premiums are sometimes asked by the smaller mills, which are paying high prices for rods. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.70
Retailers, carloads	1.75

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base.	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago.—Every effort is being made by the Wire manufacturers to satisfy the demands of consumers of Wire for manufacturing purposes, and the production is being prorated to meet the needs of the greatest number. The requirements of the Wire Fence maker are greater than ever before in the history of the trade, and despite the heavy production of field fencing there are practically no stocks in manufacturers' hands. Prices are being well maintained, as follows: Jobbers, $1.85, f.o.b., Chicago, in car lots; retailers, $1.90.

Pittsburgh.—Demand for Wire for manufacturing purposes continues heavy, and the mills are still considerably behind in deliveries, owing to shortage in cars and supply of Steel. Shipments are delayed from four to six weeks, and on special grades two months or longer. The mills are heavily sold ahead, having a considerable tonnage booked into next year. Premiums in prices are sometimes asked by the smaller mills, which are having trouble in getting deliveries of Rods and are paying very high prices for them. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.70
Retailers, carloads	1.75

The above prices are for base numbers, 6 to 9.

Jack and Safety Chain.—For some weeks the trade has been anticipating advances in Jack and Safety or Plumbers' Chain, as a result of the higher range of prices on brass goods generally. The expected advance was announced last week, amounting to about 12½ per cent. on Jack and nearly 20 per cent. on Safety Chain. As the jobbing trade undoubtedly bought liberally prior to this advance jobbers' prices to retail merchants are not likely to reflect the full advance for the present, and good buyers are able to obtain discounts of 60 and 5 per cent. on Jack Chain and 70 per cent. on Safety Chain, the figures which the jobbing trade is called upon to pay at this time.

Proof Coil Chain.—Owing to the continued scarcity and higher prices of raw materials the manufacturers of Chain, at a conference held in Pittsburgh last week, decided upon an advance of $3 a ton in prices of Proof Coil Chain. The new prices are as follows for cask lots, f.o.b Pittsburgh:

	Cents.
3/16 in.	8.10
¼ in.	5.55
5/16 in.	4.65
⅜ in.	4.00
7/16 in.	3.85
½ in.	3.75
9/16 in.	3.70
⅝ and 11/16 in.	3.65
¾ and 13/16 in.	3.55
⅞ and 15/16 and 1 and 1 1/16 in.	3.50
1⅛ and 1¼ in.	3.60

There are the usual extras on Crane Chain, which are 1¼ cents for BB Crane and 1¾ cents for BBB Crane.

Sheet Zinc.—Under date of October 24, Matthiessen & Hegeler Zinc Company, La Salle, Ill., announces the price of Sheet Zinc as $7.90 per 100 lb. in 600-lb. casks of the thicknesses from Nos. 9 to 22, inclusive, and of the widths from 32 to 58 in., inclusive, and of the lengths from 72 to 96 in., inclusive, delivered f.o.b. cars, La Salle. This price is subject to the following discounts:

	Cash with order Per cent.	Quantity. Per cent.	Total. Per cent.
Carload lots	3	5	8
9000-lb. lots	3	3	6
6000-lb. lots	3	2	5
3000-lb. lots	3	1	4
Less than 3000 lb	3	0	3

Wire Cloth.—Manufacturers of Wire Cloth are still delaying the announcement of prices for the coming season and express a desire to put off taking this step as long as possible. It is probable, however, that the necessity of opening the market on Poultry Netting will force the matter to an issue, as several companies are important producers of both lines and habitually make their prices at the same time. The opinion is generally held that the present delay will be beneficial to the trade, since a shorter time between the placing of contracts and making deliveries tends to reduce friction and the evils of excessive competition. It is declared that these advantages will be felt especially by the jobbing trade. Regarding the probable level of the market, there is good reason to believe that it will be higher than last year, not only because there is a probability that it will be in a measure, at least, under influences which will tend to keep it in control, but even more emphatically because of the prospect that the demand will be very large, labor and raw material are higher, and manufacture is being seriously curtailed by difficulty in securing skilled workmen.

Shovels.—The initial advance in cheaper grades of Shovels made by the Ames Shovel & Tool Company some weeks ago and generally participated in by independent producers has been followed by a further advance which has just been announced by several leading manufacturers. It is declared that prices are still low in comparison with the present level of the metal market, and especially in view of the increased cost of Handles. The heavy demand which keeps manufacturers behind their orders has also a decidedly strengthening influence on the market.

Copper Products.—With the present situation in Copper there are trade predictions of still further advances in some lines, the price of Ingot Copper ranging between 22 and 23 cents per pound. The present market conditions are reflected by the following prices: Soldering Coppers, 27 cents per pound, base, 300 lb. and over; Sheet Copper, 27 cents, base; Brass Seamless Tubes, 25 cents, base; Copper Seamless Tubes, 29 cents, base; Brazed Brass Tubes, 17½ per cent. discount, and Copper Wire, net list. Brass Jack Chain has been advanced to 60 and 5 per cent. discount, Brass Safety Chain 70 per cent. discount and a new list involving higher prices adopted in Brass Butts, as noted elsewhere.

Set and Cap Screws.—There is a decided scarcity of stock of Set and Cap Screws, some manufacturers stating that they are so far behind their orders that they can book no more new business for the present. In view of these conditions quotations naturally hold very firm. A firmer tendency is also noticeable in prices on Machine Screws.

Brass Butts.—A considerable change took place last week in the market for Brass Butts, affecting both list and discount, and resulting in an advance of something over 15 per cent. The upward movement was generally expected, as stated last week in these columns, and is of course attributed to the heavy advances in raw material. A change in list was decided upon largely to meet the views of the jobbing trade, who objected that the low list which has been in favor with small discounts did not give them opportunity conveniently to realize sufficient profits on the goods. To correct this difficulty the list was doubled and a base discount of 50 per cent. was established instead of 15 per cent., as heretofore.

Padlocks.—Leading manufacturers of Padlocks have advanced their prices, stating that the action is necessitated by the increased cost of raw material. On Steel Padlocks the advance amounts to from 10 to 12½ per cent. on high grade goods, and 15 per cent. on cheaper lines. Brass Padlocks are 10 per cent. higher for the better grades, with, in some cases at least, a larger advance on the cheaper goods.

Ash Handles.—Leading manufacturers of Ash Agricultural Tool Handles have announced a general advance of about 5 per cent. to take effect November 1. The advance is attributed to the high cost and increasing scarcity of lumber, manufacturers stating that they experience great difficulty in securing stock suited to their requirements.

Cast Iron Hardware.—Prices on Cast Iron Hardware, including Iron Pulleys, Grindstone Fixtures, Blind Hinges, Gate Latches, &c., are showing noteworthy firmness, and manufacturers are experiencing great difficulty in keeping up with their orders, on account of the scarcity of labor and raw material.

Tacks.—Considerable attention is being devoted in trade circles to the Tack market, which has shown increasing firmness for some weeks past. With due allowance for the customary irregularity of this line there is a general impression that the Tack situation has been strengthened materially during the last month. Extreme prices have been withdrawn almost without exception and many manufacturers are asking more or less of an advance. Tack Plate is not only higher but is declared to be very hard to obtain at the present time, with a prospect, according to good judges, that the scarcity will become more acute rather than less so before spring. Apart from the productive situation there is evidence that leading manufacturers are showing a disposition to lessen the severity of competition, and that one or more conferences have been held with that end in view. Further developments are awaited by those interested in the market, which on the present basis of cost may now to retail buyers be represented by the following quotations:

American Carpet Tacks	90 and 37½ %
American Cut Tacks	90 and 37½ %
Swedes Cut Tacks	90 and 37½ %
Swedes Upholsterers' Tacks	90 and 45 %
Gimp Tacks	90 and 45 %
Lace Tacks	90 and 45 %
Trimmers' Tacks	90 and 37½ %
Looking Glass Tacks	65 %
Bill Posters' and Railroad Tacks	90 and 45 %
Hungarian Nails	80 and 20 %
Finishing Nails	70 %
Trunk and Clout Nails	80 %

Jobbers, however, are doubtless in a position to sell at lower figures than the above, and are in many cases doing so.

Stove Hollow Ware.—An advance of about 5 per cent. on all grades of Stove Hollow Ware has been announced by the principal manufacturers of this line.

Sash Weights.—The Sash Weight market is feeling the effect of the increased cost of the raw material and the heavy demand which is made upon the foundries. Without concerted action between the manufacturers prices seem to be gradually working up, so that in the Eastern district they are represented by the quotation of $28 to $29, with a probability that $30 will be reached in the near future. In the Southern district prices also are higher and represented by the quotation of $22.50 to $25, though some manufacturers are holding for higher figures. The stock of manufactured goods is very low and difficulty is experienced in getting raw material promptly.

Window Glass.—At a meeting held last week to consider the plan of the National Brokerage Company acting as selling agent for all Window Glass manufacturers, it was learned that only 1622-pot capacity had returned signed contracts and had arranged to put up the first instalment of forfeiture money. This number falls about 400 pots short of what the committee thinks desirable to obtain to make the plan feasible. Committees were appointed to do missionary work in the hope that the required number of factories can be lined up, and this work will probably require a week or 10 days. It will be argued that if all the required factories come into the agreement they will not only have their Glass marked cheaper than they could do it themselves but that they will get higher prices than if individual manufacturers marketed the product. If the desired number of pots cannot be secured the plan of a central selling agency will be abandoned, and unprofitable prices will probably be the rule. It is reported that 90 and 15 per cent. for single and 90 and 25 per cent. discount for double strength, from manufacturers' list, are becoming quite common. It is understood that jobbers are seriously considering the advisability of forming a national organization, like the one which existed some years ago, with the view of placing bulk orders with manufacturers, if the central selling agency becomes an assured fact. Most of the idle Glass factories will probably be put in operation in the near future. Jobbers' quotations, from jobbers' list, October 1, 1903, are as follows: Greater New York, single, 90 and 10; double, 90 and 15 per cent. discount.

Rope.—Demand is reported as having fallen off somewhat during the past week, but taking the month as a whole business transacted by manufacturers is ahead of September, which was very satisfactory. The activity in the erection of buildings and bridges, also in shipping, together with the general demand throughout the country, has had a stimulating effect upon the cordage business. Heavy buying during the month of October is somewhat unusual. Owing to the high prices of Manila Hemp the prices of Manila Rope have been advanced. Sisal Rope is firmer in sympathy, and while no advance has been made in price manufacturers are not so anxious for business and are not shading prices. The firmer market may have a tendency to check buying, especially as it is late in the season. New York quotations on Rope are as follows: Pure Manila, 12½ to 13 cents; B quality, 11½ to 12 cents; Pure Sisal, 9 cents; No. 2 quality, 7½ to 7¾ cents; No. 1 Jute, ¼ in. and up, 8 to 8¼ cents; No. 2 Jute, 7½ to 7¾ cents per pound.

Paints and Colors.—The unfavorable weather during the week reduced the local and nearby demand for White Lead in Oil and for Mixed Paints. Business in both lines has been exceptionally good during the balance of the month just ended. Owing to higher cost of materials which are used in the manufacture of Mixed Paints, including Linseed Oil and Turpentine, higher prices for Paints is spoken of as possible at the beginning of the new year, if present conditions continue. No change in prices has yet been made in either Lead or Paints.

Linseed Oil.—During the past 60 or 90 days a large number of contracts have been booked by manufacturers at about 35 to 36 cents, some of these extending into next year. Specifications on these contracts are now being received, but crushers are unable to make prompt deliveries on account of the trouble railroads have to keep cars moving after the Oil has been started from the factories. This makes stocks short in jobbers' hands and interferes with supplying the demand for small lots. Seed is firm, and crushers refuse to shade prices, on the basis of 38 cents per gallon for Out of town Raw Oil. New York quotations are as follows, according to quality and seller: City Raw, 39 to 40 cents per gallon. Out of town Raw, 38 to 39 cents per gallon. Boiled Oil is 1 to 2 cents per gallon over Raw.

Spirits Turpentine.—The market is steady and firm at unchanged quotations. Demand is confined to small lots. New York quotations are as follows, according to quantity: Oil Barrels, 69 to 69½ cents; Machine Made Barrels, 69½ to 70 cents per gallon.

THE AUTOMATIC YOKE COMPANY, Indianapolis, Ind., has purchased at receiver's sale, the plant of the Wynne Hoop Company, Wynne, Ark. The Automatic Yoke Company will dispose of the hoop machinery and then move its Indianapolis plant to Wynne, which will be headquarters, a branch at Indianapolis being maintained to supply the eastern trade. The company manufactures Wagon and Agricultural Neck Yokes, Doubletrees, Singletrees, McCoy Patent Wagon and Plow goods, &c.

TRADE WINNING METHODS.

This department is for the description of approved methods of carrying on and extending business, and a cordial invitation is given to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.

POCKET KNIFE DISPLAY.

THE display of Pocket Cutlery shown in the accompanying illustration, attracted the attention of an unusually large number of persons, not so much because of the variety of Knives shown, nor because prices were given in plain figures, but on account of the unusual material on which the display was made. This was a piece of an old box cover, about ⅝ in. thick and 11 x 24 in. in size. The board was stained a dark brown and then broken so as to form ragged ends. The words, "How about a good Knife to take away with you?" were carved on the board with a Knife, the letters showing the original light color of the wood. The blades of the Knives were stuck into the board at various angles and the prices were put on with white paint. The board was stood at an angle on a show window fixture, so that it was about level with the eye of the looker-in. This display was made by Hastings & Miller, dealers in Cameras and Photographic Supplies, Sporting Goods, &c., in

Uniquely Arranged Pocket Knife Display.

one of the windows of their downtown store, 118 Nassau street, New York.

Wood can be cut in different shapes for window displays, as for instance, a light colored board, the outline of which is cut in the form of a pumpkin and painted to represent that vegetable. Such a design was used by the above firm just previous to Hallowe'en. Other designs will probably suggest themselves to the ingenious merchant as being particularly suitable for the different seasons or for special occasions.

CULTIVATING FARMERS' TRADE.

A MISSOURI MERCHANT of long experience refers to honest dealing as the best way of cultivating the trade of farmers. "Get their confidence," he remarks, "take a lively interest in their affairs, rejoice in their good crops, show sympathy in loss or distress. But," he continues, "avoid all gossip about their neighbors, and note their financial standing for your own benefit only, never hesitating, however, to warn against a rascal."

EDWARD E. DRAKE is now the sales manager of the Remington Arms Company, his headquarters being with the M. Hartley Company, 313-315 Broadway, New York, which is the sole sales representative of the Union Metallic Cartridge Company and the Remington Arms Company. Mr. Drake has for the past six years been in charge of the Pacific Coast business of these two important companies at San Francisco.

TRADE ITEMS.

THE SEYMOUR TOOL COMPANY, Seymour, Ind., has been incorporated and will manufacture Post Hole Diggers and Augers. Later it is not unlikely that other Tools will be added to the product. The officers of the company are Julius C. Birge, president; Walter W. Birge, vice-president, and Lynn Faulkconer, secretary.

THE WIRE GOODS COMPANY, Worcester, Mass., has issued a folder in which the subject of quality is touched upon as related to a manufacturer's product. The folder is accompanied by a leaflet in which a view of the company's shipping room and shipping force is given.

SURPLESS, DUNN & Co., manufacturers' agents, 74-76 Murray street, New York, have been appointed sales representatives of Vaughan & Bushnell Mfg. Company, Chicago, whose large and varied line of Hand, Adze, Eye Nail and Machinists' Hammers and other tools is widely and favorably known in the trade.

PRITCHARD-STRONG COMPANY, Rochester, N. Y., manufacturer of Prisco Lanterns and Bread Mixers, was effectively represented at the Atlantic City conventions. The company's representatives, R. B. Alford, H. G. Strong and J. H. Cumming, occupied a suite at the hotel, where they entertained their friends and incidentally showed some attractive samples of their line.

ORLANDO LANE BECKNELL of Chicago, died October 21, at Oconomowoc, Wis. Mr. Becknell was for 27 years associated with the David Beadley Mfg. Company, manufacturer of Agricultural Machinery, and went from that concern to the Chicago Screw Company as manager. He subsequently incorporated the Illinois Screw Company, and three years ago this company was consolidated with the Chicago Screw Company, Mr. Becknell being made secretary, treasurer and general manager of the combined interests. This position he held till March, 1906, when illness compelled him to retire. Mr. Becknell was born at Underhill, Vt., and was 65 years old.

THE HUMPHREYES MFG. COMPANY, Mansfield, Ohio, has removed its New York City office to 636 and 638 West Thirty-fourth street. Here also will be a salesroom and a warehouse. In the latter will be carried a large stock of Pumps, both hand and power; Sanitary Enameled Ware, including Bathtubs, Lavatories, Sinks, &c., and a complete line of Plumbers' Brass Goods. These increased facilities will enable the company to handle its domestic and export business in a much more satisfactory manner than ever before. A. I. Laing, who is well known to jobbers and exporters in the East, will continue to have charge of the New York office.

THE SAN ANTONIO HARDWARE COMPANY, San Antonio, Texas, has lately been incorporated with a capital of $150,000. The company will be ready for business by the first of January, and will wholesale exclusively, covering central and southwestern Texas. The officers of the company are: S. J. Jeffers, president; J. A. Brownlee, vice-president and general manager; C. Ganahl Walker, secretary, and W. W. Sauger, treasurer. These persons, with C. V. Birkhead, San Antonio; Chas. J. Vivroux, Seguin, and Alfred Tips, Runge, comprise the directory. Mr. Brownlee, the organizer and manager of the company, was formerly connected with the Norvell-Shapleigh Hardware Company, St. Louis. He will be in New York City from November 1 for the purpose of purchasing stock for the new house, and may be seen or addressed at the Hotel Astor.

THE well-known house of E. O. Hall & Sons, Honolulu, H. I., has increased its capital stock from $250,000 to $300,000. This has been necessitated by the material growth in the trade done by the house and the taking over of the business of the Pacific Hardware Company.

W. C. McKain, Youngstown, Ohio, will dispose of his retail Hardware business in that city and retire.

TALKING POINTS IN SELLING HARDWARE.

IN the very able address of E. M. Bush, president of the National Retail Hardware Association, delivered at the Atlantic City convention and quoted in last week's issue of *The Iron Age*, the matter which attracted greatest attention was his appeal to manufacturers to assist retail merchants and their salesmen by furnishing them with more information regarding their goods.

"Why don't you tell us," he asked, "wherein lie the special merits and advantages of your particular brand? Help us to know more about you and your goods. Tell us for how many years your Saw or Chisel has been made, of what sort of steel or other material, its improvements, how to use to best advantage, exact dimensions, why you know it to be better than its rival in the trade. The maker of an article should certainly know best the merits of his product. Print this information upon a slip to be inclosed in box or pasted upon the package. This slip will better enable proprietor and clerks to sing your praises and talk the merits of your goods."

Mr. Bush went on to illustrate his point as follows:

I am reminded of the experience of a Western retailer who two or three years ago took the sale of a certain Skate (which, by the way, bears a private brand). In each box of Skates a neatly printed card with the special features and component parts of the Skate subdivided into heads and emphasized by being printed in red ink, reads as follows:

Valuable Hints for the Use of Retail Salesmen.

No Name Skates

RUNNERS	Made of carefully selected, toughened Hi-carbon Steel, extra broad at base. Hollow ground.
FOOT	Made from tested Homogeneous Steel.
PLATES	Shaped to conform to foot. Owing to its peculiar construction it is the lightest, and at the same time the most rigid in the world.
CLAMPS	Are made of tested Homogeneous Steel. The heel clamps are of extra hight. No Name Skates will "STAY ON" no matter how badly the heel may be worn. The toe clamps are of the improved, self-adjusting pattern, which places the runner in the center of the foot. *Just the thing for Bull Dog Shoes.*
LEVER	Positive lock. Will not jar loose.

I am told that every salesman in this town, when showing these Skates, dwelt so upon the phrase "Homogeneous Steel Foot Plate and Clamp," that no small boy of the town felt himself "in it" unless he had a pair of "ingenious steel Skates," and the order for these Skates placed by this retailer for his winter's trade was large enough to merit special mention in a general letter to this jobber's salesmen.

In giving this excellent example of the assistance which may be rendered the retailer, it will be noted that Mr. Bush was describing a jobber's methods of pushing goods bearing his private brand. Names were not mentioned, but the Skate circular was at once recognized as one issued by the Norvell-Shapleigh Hardware Company, St. Louis. Selling points for retail salesmen have been packed with this company's special brand goods for the past two years, and the results of this excellent plan have been quite as gratifying on other lines as on the Skates referred to by Mr. Bush.

The methods pursued by this house in the way of giving information which will be valued by merchants may be further illustrated by the examples which follow. It will be seen that in the circulars reproduced below the company touches not only upon the general character and quality of the goods in question, but furnishes means by which the salesman, be he proprietor or clerk, can gain useful information and at the same time be furnished with talking points of which he can make use in showing up the goods. The value of such information is obvious.

Following is the descriptive part of the circular packed with the company's brand of Hand Saws:

GRINDING	DIAMOND EDGE Hand Saws are TAPER GROUND by Hand. They are FOUR GAUGES thinner on back at POINT than at CUTTING TEETH, and FOUR GAUGES thinner on back at POINT than at BACK NEAR HANDLE. This reduces the friction and makes the saw run easy. The body within EIGHT INCHES OF HANDLE is same gauge at back as at CUTTING TEETH. This gives RIGIDITY TO BLADE and PREVENTS BUCKLING.
FILING	Teeth are BEVEL FILED by HAND. Every tooth is thus given a SHARP NEEDLE POINT, which makes the Saw CUT FAST and with LITTLE EFFORT.
HANDLE	Is made of APPLE WOOD, Perfection Style, CARVED by HAND, and Polished. HAND HOLD is near CENTER of blade, which makes the Saw HANG RIGHT and RUN EASY.
QUALITY	DIAMOND EDGE HAND SAWS are made of the FINEST QUALITY of HAND SAW steel. They are HAND SMITHED, tempered in OIL, and are intended for FINE MECHANICS' use.

The vast difference between information of this kind and the vague generalities and sweeping but indefinite claims often made by some jobbers and manufacturers is immediately apparent. It is not merely stated that the Saw runs easy and cuts fast, but it is clearly explained how the grinding and filing are done so as to secure these results. There is indeed in such information almost an invitation to take up the Saw and show the prospective purchaser the difference in gauge and point out the resultant advantages. The circular tells why the blade is rigid and will not buckle, what the handle is made of, how it is finished and calls attention to the hang of the tool, a matter of especial importance to all practised workmen.

Equally well prepared are the following hints referring to other kinds of tools:

Chisels.

BLADES	Made of special analysis steel, especially adapted for tools requiring a FINE CUTTING EDGE.
TEMPER	"DIAMOND EDGE" Chisels are hand tempered and hardened by a secret process, which ELIMINATES SOFT SPOTS, and insures a uniform temper. A perfect cutting edge is thus secured at EVERY GRINDING.
HAND HONED	Every Chisel is SHARPENED by HAND and is ready for use. Blades are polished to an extra fine finish.
TESTING	When the proper temper has been obtained every tool is subjected to a SEVERE STRAIN of from 200 TO 500 POUND PRESSURE, which brings out any defects. The elasticity of the blade thus proves the EXCELLENT QUALITY of the tool.
HANDLES	The handles are made of selected polished hickory with LEATHER CAPS. The very best obtainable.

Hammers.

MANUFACTURE	All Hammers bearing the "DIAMOND EDGE" BRAND are drop-forged from BAR HAMMER STEEL of the very best quality. They are HAND-GROUND and polished to a HIGH FINISH. They are carefully tempered and temper is drawn to a TOUGHNESS that enables them to stand VERY SEVERE USAGE.
HANDLES	The handles are made of choice young SECOND GROWTH HICKORY, and driven with a view to giving the tool a PERFECT HANG and BALANCE.

The methods of the company pursuing this system of introducing and pushing its goods are to be commended not only for their enterprise and business efficiency, but also for the resulting betterment of the service rendered the consumer, which in the last analysis is the fundamental object of all mercantile effort. Few retail stores are manned throughout with experienced clerks, fully familiar with the lines they handle. In many cases

customers in a Hardware store are waited on by young men just learning the business, whose efficiency would be greatly increased by having at their command such information as is given above. If, as is often the case, the customers know little or nothing about the articles they require, the points brought out in these selling hints and passed on even through an inexperienced retail clerk must be of great practical assistance in making a purchase. And it is none the less true that the technical details given regarding material and construction are equally valuable to experienced clerks and buyers alike.

REQUESTS FOR CATALOGUES, &c.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM J. S. HOUK, Owego, N. Y., who has leased the store adjoining his present establishment to accommodate his increasing business. The addition will be used for Stoves, Tinware and Plumbing Supplies.

FROM NESS & WAGNER, Wapato, Wash., who conduct a retail business in Shelf Hardware, Stoves, Tinware, Paints, Oils, Glass and Sporting Goods, and who contemplate putting in a line of Agricultural Implements for the spring of 1907.

FROM C. A. KEEL, who has succeeded to the business of W. H. Lohr, Howe, Neb., carrying a line of Shelf and Heavy Hardware, Stoves, Tinware, Paints, Oils, Sporting Goods, Furniture and Harness.

FROM THE F. E. WILSON HARDWARE COMPANY, Boulder, Colo., which has been incorporated with a capital stock of $20,000 to conduct a retail business in Shelf and Heavy Hardware, Stoves, Tinware, Sporting and Athletic Goods.

FROM V. S. KELSEY, who has purchased the Hardware, Stove, Implement, Paint and Sporting Goods business of Kimball Hardware Company, Kimball, Kan.

FROM P. H. HEFT, successor to Heft & Timberman, Bentley, Iowa.

FROM THE RITER HARDWARE COMPANY, Hamlin, Texas, which has been incorporated with a capital stock of $10,000. The company will carry on a retail business in Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils and Sporting Goods.

FROM CALCASIEU LONG LEAF LUMBER COMPANY, Lake Charles, La., which desires printed matter relating to Builders' Hardware and Mill Supplies.

FROM C. H. CASEY, Jordan, Minn., whose store was destroyed by fire several weeks since with a loss of $30,000, nearly covered by insurance. Mr. Casey with characteristic energy and enterprise secured quarters elsewhere and had resumed business within five days after the fire.

FROM A. M. FRIESEN, who has purchased the store of Thiessen & Co., Jansen, Neb., carrying Shelf and Heavy Hardware, Stoves, Tinware and Paints and Oils.

C. EDWARD WOOD has lately been appointed general sales manager for the Dominion Cartridge Company, Limited, Montreal, Canada. Mr. Wood was formerly associated with the Simmons Hardware Company, St. Louis, but for the past six months has been in charge of the United States business of the Dominion Company, and is regarded as well fitted to further its interests.

AUSTRALIAN NOTES.

FROM A SPECIAL CORRESPONDENT.

MELBOURNE, September 22, 1906.

THE Hardware trade, both as regards local and interstate trade, has been pretty good during the past month or two, and accounts are being met in a very satisfactory manner. Engineers and iron founders are keeping busy, and mining requirements have improved.

Melbourne has just got through its annual agricultural show. The city has been overrun with country cousins and these, blessed with fine weather during their stay and the assurance of a good harvest, have left golden echoes of their visit in the cash boxes of Melbourne traders.

Agricultural Implements.

The following schedule of Harvesting and Agricultural Machinery duties was adopted by the Australian House of Representatives on September 7. It yet remains for the Senate to ratify them:

That in lieu of the duties of customs imposed by the customs tariff of 1902 on the items shown in the attached schedule, duties of customs shall from September 8, 1906, at 4.30 p.m., Victorian time, be imposed as follows:

FIXED OR SPECIFIC DUTIES: Stripper Harvesters, each, £12; Strippers, each, £6; metal parts of Stripper Harvesters and Strippers, per pound, 1¾ pence.

25 PER CENT. AD VALOREM: Stump Jump Plows; Disk Cultivators; Fertilizers and Seed Drills; Winnowers, horse and other powers; combined Corn Sheller, Husker and Bagger; combined Corn Sheller and Husker.

20 PER CENT. AD VALOREM: Plows, other; Plow Shares; Harrows; Chaff Cutters and Horse Gear; Cultivators other than disk; Scarifiers; Plow Mold Boards; Corn Shellers; Corn Huskers.

The following goods shall be free of customs duty: Manufactures of metal—viz., Hand-worked Rakes and Plows combined; Hay Tedders; Maize Harvesters; Maize Binders; Maize Planters; Mold Board Plates in the rough and not cut into shape; Potato Sorters; Potato Raisers or Diggers.

Immediately on the decision of the House of Representatives becoming known H. V. McKay, the maker of the Sunshine Harvester, took advertising space in the local papers announcing that the price of his Harvester would be reduced from £81 to £75 immediately on the Senate ratifying the decision of the lower house. It is understood that over 2000 Sunshine Harvesters were sold during the past year, so this reduction will mean £12,000 per annum saved to the farmers and will help along the protectionist cause.

The bill to give effect to the import duties on Agricultural Implements passed to second reading in the House of Representatives last night. In addition to setting out the duties the bill now fixes the selling prices of Implements as follows:

On and after February 1, 1907: Stripper Harvesters, 5 ft. and under, £70; 5 ft. 6 in. to 6 ft., £75; 6 ft. and over, £80.

On and after February 1, 1908: 5 ft. or under, £65; 5 ft. 6 in. to 6 ft., £70; 6 ft. and over, £75.

The following schedule of maximum prices for Seed Drills and Fertilizers was agreed to, the Minister explaining that the prices were 5 per cent. less than the present selling price for the first year and 10 per cent. less afterward:

Australian Drills (Fertilizer, Seed and Grain), On and After February 1, 1907.

	Hoe Drills. £	s.	d.	Disk Drills. £	s.	d.
11 x 7	30	17	0	32	15	0
13 x 7	33	5	0	35	3	0
14 x 7	34	4	0	36	2	0
15 x 7	36	2	0	38	0	0
16 x 7	37	1	0	38	19	0
On and after February 1, 1908:						
11 x 7	29	6	0	31	2	0
13 x 7	31	12	0	33	8	0
14 x 7	32	10	0	34	6	0
15 x 7	34	6	0	36	2	0
16 x 7	35	4	0	37	0	0

Subsoil Packers were added to the free list.

Andrew Agnew & Co., Limited, one of the oldest established firms of general Hardware merchants in Melbourne, are transferring their business to a limited company to be known as Andrew Agnew, Limited.

RETAIL HARDWARE ASSOCIATION OF THE CAROLINAS.

AT a meeting of the South Carolina Association held last June a resolution was adopted authorizing the secretary, Paul W. McLure, Greenwood, to canvass the merchants of North Carolina with a view to securing their membership in the association, and if a sufficient number of accessions was secured the style of the organization was to be changed to the Retail Hardware Association of the Carolinas. It was only necessary for Mr. McLure to visit a few of the North Carolina towns to obtain the desired number of members, the matter upon being broached being received with enthusiasm and hearty support, so that an association representing both States is now an accomplished fact. A general canvass of North Carolina is not being made at this time, as the next meeting of the association will probably be held in some city of that State, and a vigorous effort will be made to secure the attendance of as many North Carolina merchants as possible.

The membership of the association in South Carolina is now said to embrace 75 per cent. of all the Hardware merchants of the State. As yet they have no State mutual fire insurance company, but plans for a company are being shaped, and it is expected to have one in operation within a year. In the meantime quite a number of the members are taking out insurance with the Hardware mutual companies established in other States.

As a result of the formation of the association more harmony exists between competing merchants than ever before. With local industries in prosperous condition and money plentiful, merchants are exerting themselves to obtain business by giving better service to their patrons rather than by cutting prices.

TRIBUTE TO GEORGE J. LAIGHTON.

AT a recent meeting of the Board of Governors of the Hardware Club of New York the following minute was adopted in regard to the late George J. Laighton, expressing the honor and appreciation in which he was held:

The Board of Governors of the Hardware Club of New York desire to record their sense of the loss sustained by them and by the club in the death of George J. Laighton, a charter member of the club and one of its governors from 1897 to 1904.

As a member he was ever loyal and enthusiastic, and as a governor a wise counsellor and an earnest advocate of all that tended to promote its prosperity.

As a man of business he occupied a prominent position and exemplified a high type of the Christian merchant and manufacturer in his sterling integrity, breadth of view, dignity and uprightness of character, combined with a genial and cheery bearing and an attractive personality.

As a citizen he was patriotic and watchful for the welfare of his country, and in his private life consistent, generous and active in the furtherance of religion and philanthropy. In view of his personal traits, the worthiness of his character and the broad reach of his interests he had many friends by whom he was held in very high esteem.

The governors direct that this expression of their regard be spread in full on their records.

PETER A. FRASSE & CO.

PETER A. FRASSE & CO., 92-94 Fulton street, New York, have bought all of the patents, patterns, jigs, castings, fixtures, machinery and material relating to the well-known Stephens Vise, which until recently was manufactured by the National Vise & Tool Company, Woodstown, N. J.; also of the Snediker quick acting Screw Vise and the Snediker patent quick acting Blacksmiths' Leg Vise. P. A. Frasse & Co. will continue the manufacture of these well established lines of Vises at a plant located in Yonkers, N. Y. They will also manufacture a line of Bulldog Pattern Vises. G. L. Snediker, Jr., is now in the employ of P. A. Frasse & Co. in the capacity of superintendent, thus continuing the manufacture of these goods along the same lines as formerly.

MANUFACTURERS' CUTS FOR RETAIL MERCHANTS.

IN his recent address before the manufacturers and jobbers at Atlantic City, E. M. Bush, president of the National Retail Hardware Association, referred to the great difficulty experienced by retail merchants in writing good newspaper advertisements. He declared that the average retailer of Hardware had neither the time nor the knack for preparing good ads frequently and could not afford to pay for expert service, and stated his belief that manufacturers offering practical assistance in this direction would receive substantial returns in the increased sales of their products.

Landers, Frary & Clark, New Britain, Conn., are offering this sort of assistance to retail merchants handling their Table Cutlery and Universal Food Choppers, which they are also advertising extensively in general periodicals. The company has recently issued two large circulars addressed to the trade, explaining the service offered and reproducing some excellent cuts of different sizes, single and double column, for insertion in local newspapers and other mediums. Some of these include advertisements completely written, with mortised space for the retailer's name and address. Others, consisting of head or tail pieces and borders, afford a setting for original copy in the merchant's own particular style. A selection of these cuts may be ordered direct from the manufacturer, and will be furnished free of charge with booklets, circulars, mailing slips and window hangers, as desired. Special attention is called to the opportunities for pushing the sale of these lines during the fall and holiday season.

THE RUSSELL JENNINGS MFG. COMPANY.

THE RUSSELL JENNINGS MFG. COMPANY, manufacturer of the genuine Russell Jennings' Augers and Auger Bits, is erecting a large and commodious office building at its main factory plant in Chester, Conn. The building is of brick, with granite foundations and trimmings, two stories high, and is to be completed during the next month or two. It is the intention of the company to remove its offices from Deep River before January 1, and thereafter the business will be conducted from Chester. The company's manufacturing plant has been located in Chester since 1865, and for more than 40 years the office has been maintained in the adjoining town of Deep River, about 2 miles distant, thus entailing a large amount of unnecessary work and much inconvenience. The company is driven with orders and is still carrying out the policy "that quality and workmanship are the only true means of building up and maintaining a successful business."

NORTH DAKOTA RETAIL HARDWARE ASSOCIATION.

AT a recent conference between representatives of the North Dakota Retail Hardware Association and the Northwestern Implement Dealers' Association it was determined to hold the 1907 annual meetings of the two organizations as follows: The Hardware Association will commence its meeting on Monday, February 4, and continue through the 5th and 6th. The Implement Association will have its first session on February 6, and continue through the 7th and 8th. The meetings will be held in Minot, and from advices received everything is being done to make the week a notable one for the members of both associations. The gathering of merchants promises to be an exceptionally large one, as the section of the State in which Minot is located has increased in population more rapidly than any other part of North Dakota.

THE LORAINE MFG. & TOOL COMPANY, Chicago, has incorporated to manufacture Tools and Hardware Specialties. The company expects to be in shape for business in a short time, and has an office at 115 Dearborn street. The incorporators are Harold White, Frederick Dickinson and Harry C. Nelson.

Fancy Metal Ware in the Hardware Store.

THERE is probably no specialty line more closely allied with Hardware nor better adapted to be handled in connection with it than what may be comprised under the general term of fancy Metal Ware. This includes not only fancy Hollow Ware, such as Chafing Dishes, Tea and Coffee Pots, Percolators, Tea Sets, Serving Dishes, Soup Tureens, Trays, &c., but fancy Table Cutlery, Lamps and a great variety of articles made wholly or in part of nickel, brass, copper and other metals and usually referred to as Art Metal Goods. The past 15 or 20 years has seen many of these lines pass very largely into the control of the so-called department store.

But a moment's consideration is sufficient to show that the evolution has taken place largely at the expense and through the narrowing of the Hardware trade.

There has been a tradition among Hardware men—and it is by no means dead—to the effect that they are above handling goods carried to any extent by merchants in other lines. With many Hardware merchants it seems to be a matter of pride that their stock covers

A Line Peculiarly Their Own,

that they cater to a distinct class of customers, principally men, and that their business is almost paramount to a profession in that its details cannot be picked up readily, but can only be mastered by long experience. This indeed is true on the ground that Hardwaremen are not annoyed to any great extent by upstart competition—that is, by stores springing up in a night to share their trade, nor do they have to reckon much with citizens of foreign extraction. At the same time this source of pride and comparative security to the Hardware merchants has led some of them into the error of

Narrowing the Scope

of their business by giving up many valuable lines and failing to take on others from which a handsome profit might be derived. When department stores have put in a certain article some Hardware merchants have made that a pretext for giving it up and immediately quitting the field, while the fact that furniture or toy stores carried a line has been sufficient excuse for refusing to put it in. Take, for instance, Tea and Coffee Pots and Table Cutlery and Spoons. Time was when the Hardware store was the headquarters for these goods in the majority of towns and cities. Now we often find them carrying only a nominal stock of cheap, staple grades, paying a minimum profit. That this is a mistaken policy is evidenced by the pronounced success of those who have adopted the opposite course.

Recognizing that profits on many staple lines have been reduced to a minimum, enterprising and aggressive merchants have been quick to seize upon and feature all allied special lines comprehended by their facilities on which better margins could be obtained. Going further, many have recognized it the part of wisdom to increase their facilities, and to enlarge their force when necessary to handle such lines to best advantage.

Everything Having Metal as a Base

is the slogan of some of the most successful and far-sighted men in the trade to-day, and they are successfully disputing the field on goods whose exploitation had been given over almost entirely to the modern department stores. The latter have not cut fancy lines to an unprofitable basis, but, on the contrary, it is just such lines that department stores stock and display most liberally because they are highly remunerative and make up the profits lost in selling common, every-day articles at cost or on a very small margin.

Catering to Women's Trade.

Few people understand the real secret of the department stores' growth. It lies in the fact that having established themselves by serving a certain class of buyers, they made it their province to supply, in the greatest possible variety, everything required by that class.

Women are the patrons that they cater to, the largest consuming buyers in any community, not only of wearing apparel but of house furnishing goods and everything entering into the domestic economy.

Department stores got to carrying Hardware because the women asked for it. Mrs. Jones, who came in to buy needles or a buttonhook, asked, "Do you keep Tacks?" She also needed a Hammer to go with them. The next woman wanted a Potato Parer; the next, a Meat Chopper; the next, Tablespoons, and so on to Ash Cans and Refrigerators. The department store proprietor followed his cue. Women buy Hardware. He had the women customers; he got what they wanted. The Hardware merchant can reason just as well. He has the Hardware; he must get the women!

Importance of Attractive Stores.

His task is more difficult than his new competitor's. How shall he begin? By advertising? Advertising is like charity. Merchants with untidy stores make a mistake to advertise. They attract people to their stores who go away and give them a bad name. The point is clear. The Hardware store must be made so attractive as to draw and hold women customers. It should be its own best advertisement. This does not necessarily mean that it should contain hundreds of dollars' worth of hardwood fixtures and plate glass mirrors.

Handsome furnishings are effective and create a good impression, but there is this advantage in favor of the merchant who decorates with handsome goods: He can sell them at a profit.

A japanned Box Opener couldn't be made attractive to a woman by keeping it in a mahogany mirror-back showcase with gold corner braces. But a half dozen Chafing Dishes and as many Copper Percolators arranged on a white painted pine board would rivet her attention. They wouldn't sell as fast as Coal Hods. For a time, one might think he had tied up his money in dead stock. Perhaps it would be more comfortable not to call them stock; call them fixtures and put them into capital account.

How Trade Starts.

At last Mrs. Smith will happen in for something, or the window display will catch her eye and she will be happily surprised in the store. She will buy a Percolator or something else, and before long she will have found a way to bring it to the attention of a large number of her friends. Talk about advertising!

"Where did I get it? Why, at Longhead's. You haven't been there! Well, you must go there the next time you are downtown. It's the swell metal store, you know. The loveliest goods, splendid service, and they keep everything."

That starts the ball a-rolling. Thenceforward "fixtures" will be a profitable line.

In handling Fancy Ware a merchant must make up his mind to carry enough stock to make a good showing and give up sufficient good space for adequate display.

Some make the mistake of letting the stock wait on the demand. Trade cannot be cultivated in this way.

The Hardwareman Has Many Advantages

in claiming the trade on fancy lines. In the first place, his store is usually more accessible, being located often times on the edge of the residence district instead of in the heart of the city, as the department store always is. The department store is also always crowded, and its service is notoriously slow. A lady must give up half a day to go there shopping, while she can run down to the Hardware store, get waited on quickly and be home in a hour. Then

In the Matter of Service

the balance is greatly in favor of the smaller merchant. The best trade dislike to patronize the department store.

They have to rub elbows with a class that they object to. They are annoyed by the waiting, by being vaguely directed from one counter to another, and by the indifference and ignorance—not to say impertinence—of the saleswomen. The bargain sale atmosphere is everywhere, and it is humiliating. In a properly conducted and well manned Hardware store they are waited on by men who meet them at the door, can guess what is wanted even when the customer has but a hazy idea, conduct them courteously about the store, explain intelligently the comparative features of different articles, and finally show them out. All this begets confidence in the customers and increases their self-respect. They think,

"After all, the only place to buy Metal Goods is at a store where that is the principal line. They know how things are made and what they are made of. They can tell you things you don't know. No doubt their goods are a great deal better than the department stores, who buy things just because they are cheap."

Efficient Salesmanship

gives the Hardware merchant another great advantage in pushing fancy lines. In the department store the sales girls are likely to sell just what is asked for—nothing more and nothing better. In many cases most of their information about the goods they handle is picked up from customers. A clerk whose abilities are so circumscribed has no place in a Hardware store. The following incident is related by a gentleman representing a prominent manufacturer of Chafing Dishes, Percolators and Fancy Metal Ware: A woman of obvious position and refinement approached a counter in one of the metropolitan department stores and said:

"I want a Coffee Pot—something that is really good. The last two or three Pots I've had have either leaked or rusted, or the lids have broken or the handles have come off, and given us a lot of trouble. Now I want a Pot that will make good coffee, that will stand service and look well on the table."

The sleepy eyed girl behind the counter took down three Pots from the shelves, and, after looking at the price tags, said:

"Here is one for $1.69, here is one for $2.49, and this is $3.38."

As the girl said nothing more, but stood gazing inquiringly at the customer, the lady finally picked up one of the Pots and, looking at it rather vaguely, asked:

"Now, is this really a nice Pot?"

"Oh, yes'm; that is something very good, indeed." Another pause.

"What is the difference between this one at $1.69 and this one at $3.38? They look as if they were made of the same thing."

"Yes; they're made of the same thing exactly."

"Well, what is the difference?"

"Why, you see this one is a little more elaborate than the other, a little better design, you know."

"Is that all?"

"That's about all."

"And will this wear just as well as that?"

"Oh, just about as well."

"Well, I'll take this one."

Now the girl sold that woman, or rather the woman sold herself, an ordinary metal Pot of average quality. One of the higher priced pieces she looked at was porcelain lined, but the cover was never lifted. The other was superior in every detail of construction. No wonder the manufacturer's representative gnashed his teeth as he stood by and watched. That woman came in after the best thing that she could find. She had had trouble with cheap trash and she was done with it. She would have willingly paid the highest price if the clerk had given her any intelligent reason for doing so, or demonstrated the better article in any way.

Cannot the average Hardwareman turn his opportunities to better advantage? Ought he not to hold trade against competition of this sort?

Summarizing the Advantages

of the Hardware merchant for handling fancy trade, his store is accessible, it is not crowded with bargain hunters undergoing great discomfort and inconvenience for the sake of saving a few cents. His stock is kept on the main floor, not in a remote corner of the basement. He is a recognized specialist in the line and his clerks are intelligent men who understand the construction and can explain the salient points of the goods they handle. If a customer calls for an article they do not have to chase around the store to find out what it is and whether the merchant has it or not, and the salesmen are not so stupid or indifferent as to sell cheap articles that pay little profit when by painstaking demonstration the customer can be induced to buy something that will give better satisfaction as well as yield far greater returns.

Finally, there is one consideration which more than any other should influence a Hardwareman to make his store a recognized headquarters for fancy Metal Ware: That is the

Importance of the Christmas Trade.

The holiday season is hay making time for many industries which barely pay expenses during the balance of the year. The profits made on some lines, however, between December 1 and January 1 are so large as to justify carrying an expensive stock which is not profitable at any other season. Department stores would not keep one-half their toys, knick-knacks, pictures and fancy articles if it were not for their annual trade with Santa Claus. In order to hold that trade, however, it is necessary for them to stand as headquarters for those lines throughout the balance of the year. Here is another lesson for the Hardwareman:

Fancy Metal Ware is always subject to a moderate trade, but it is worth while for him to carry an attractive stock throughout the year, so that the community will recognize him as a leader during the holiday season.

Christmas shoppers do not as a rule go into a store after one article. Their errands are so numerous that they economize time and travel by getting as many things as they can at the same place; therefore the Hardware merchant must have a great many lines to attract them as well as to hold them after they are inside his store. Christmas shoppers do not haggle about price. They are not looking for the cheapest thing of the kind they have in mind. People are ashamed to give away what is not obviously superior in quality. They buy better things for others than they would for themselves. No wonder merchants in every line strive after holiday trade and expend large amounts in advertising and making their stores attractive when such buyers are in the market!

Hardwaremen Have Great Opportunities

in this direction which many have been slow to take advantage of, and no line is better adapted to the purpose or better calculated to appeal to the substantial popular taste than fancy Metal Ware. Following is a partial list of articles which may be included under this head. Most of our readers will doubtless be able off-hand to enumerate as many more:

A Few Fancy Metal Ware Articles.

Chafing Dishes
Percolators
5 o'Clock Tea Kettles
Tea Sets
Serving Trays
Crumb Sets
Dish Covers
Fancy Table Cutlery
Spoons
Nut Crackers
Nut Picks
Carver Rests
Table Pepper Grinders
Table Bells
Fancy Cork Screws
Bottle Openers
Bottle Holders
Pocket and Traveling Flasks
Shaving Sets
Fancy Key Rings and Chains
Bathroom Fixtures
Fire Sets
Andirons
Spark Guards
Lamps
Clocks
Candlesticks
Snuffers
Alcohol Stoves
Umbrella Stands
Wall Racks and Brackets
Mirrors

Wine Coolers
Smoking Sets
Cuspidores
Match Stands
Ash Trays
Ink Stands
Paper Cutters
Letter Openers
Metal Toys

JOBBERS' REPRESENTATION AT ATLANTIC CITY.

THE attendance of jobbers at the Atlantic City convention, the proceedings of which were reported in our last issue, was probably larger than at any former meeting of the National Hardware Association. The following list of those present will be of interest as indicating the wide territory covered by the association and the large percentage of the membership which was in attendance:

MOORE & HANDLEY HARDWARE COMPANY, Birmingham, Ala.: J. D. Moore.
WEBBER-AYERS HARDWARE COMPANY, Fort Smith, Ark.: W. W. Webber.
DUNHAM, CARRIGAN & HAYDEN COMPANY, San Francisco, Cal.: Brace Hayden.
PACIFIC HARDWARE STEEL COMPANY, San Francisco, Cal.: H. L. Arnold.
BRONSON & TOWNSEND COMPANY, New Haven, Conn.: L. H. Bronson.
L. L. ENSWORTH & SON, Hartford, Conn.: L. L. Ensworth.
F. P. MAY & CO., Washington, D. C.: F. P. May.
KING HARDWARE COMPANY, Atlanta, Ga.: Geo. E. King.
PALMER HARDWARE COMPANY, Savannah, Ga.: A. B. Palmer.
TROUT HARDWARE COMPANY, Chicago, Ill.: Geo. W. Trout.
CLARK, QUIEN & MORSE, Peoria, Ill.: C. D. Clark.
ISAAC WALKER HARDWARE COMPANY, Peoria, Ill.: Frank H. Jack.
MOREHOUSE & WELLS COMPANY, Decatur, Ill.: C. M. Hurst.
VAN CAMP HARDWARE & IRON COMPANY, Indianapolis, Ind.: C. Van Camp.
POGUE, MILLER & CO., Richmond, Ind.: G. W. Miller and Jonas Gans.
HUBER & KALBACH COMPANY, Oskaloosa, Iowa: V. E. Hamilton.
W. A. L. THOMPSON HARDWARE COMPANY, Topeka, Kan.: J. G. Bauer.
BLISH, MIZE & SILLIMAN HARDWARE COMPANY, Atchison, Kan.: J. B. Silliman.
THE LEE HARDWARE COMPANY, Salina, Kan.: H. D. Lee and Chas. L. Schwartz.
STAUFFER, ESHLEMAN & CO., New Orleans, La.: B. F. Eshleman.
THE EMERY-WATERHOUSE COMPANY, Portland, Maine: W. Chamberlain.
EDWARDS & WALKER COMPANY, Portland, Maine: Frederick Walker.
N. H. BRAGG & SONS, Bangor, Maine: C. F. Bragg.
CARLIN & FULTON, Baltimore, Md.: G. L. Irvin
E. L. PARKER & CO., Baltimore, Md.: Henry O. Reese.
W. C. NIMMO & CO., Baltimore, Md.: W. C. Nimmo.
BIGELOW & DOWSE COMPANY, Boston, Mass.: Samuel A. Bigelow and Chas. King.
BALDWIN, ROBBINS & CO., Boston, Mass.: A. H. Decatur and W. A. Hopkins.
BROWN-WALES COMPANY, Boston, Mass.: F. B. Wilde.
JOSEPH BRECK & SONS CORPORATION, Boston, Mass.: J. F. Breck.
FITZ, DANA & CO., Boston, Mass.: P. E. Strauss.
THE HERRICK COMPANY, Boston, Mass.: Geo. W. Herrick.
RICHARDS & CO., Boston, Mass.: Edwin E. Farnham.
AUSTIN & DOTEN, Boston, Mass.: Francis B. Austin and Henry L. Doten.
ARTHUR C. HARVEY COMPANY, Boston, Mass.: Arthur C. Harvey and C. W. Henderson, Jr.
WAITE, RANLET & CO., Boston, Mass.: H. W. Waite and A. H. Ranlet.
E. P. SANDERSON COMPANY, Boston, Mass.: E. P. Sanderson.
CHAS. C. LEWIS COMPANY, Springfield, Mass.: Charles C. Lewis.
STANDART BROS., LIMITED, Detroit, Mich.: Geo. G. Bogue.
MORLEY BROTHERS, Saginaw, Mich.: R. C. Morley.
FOSTER, STEVENS & CO., Grand Rapids, Mich.: C. C. Philbrick.
MARSHALL-WELLS HARDWARE COMPANY, Duluth, Minn.: H. C. Marshall.
KELLEY-HOW-THOMSON COMPANY, Duluth, Minn.: G. W. Welles.
HACKETT, WALTHER & GATES HARDWARE COMPANY, St. Paul, Minn.: T. G. Walther.
FARWELL, OZMUN, KIRK & CO., St. Paul, Minn.: Frank B. Platt and R. A. Kirk.
WYETH HARDWARE & MFG. COMPANY, St. Joseph, Mo.: J. A. Warner and Huston Wyeth.
NORVELL-SHAPLEIGH HARDWARE COMPANY, St. Louis, Mo.: S. Norvell.
RICHARDS & CONOVER HARDWARE COMPANY, Kansas City, Mo.: Geo. B. Richards.
WRIGHT & WILHELMY COMPANY, Omaha, Neb.: W. S. Wright.
JOHN B. VARICK COMPANY, Manchester, N. H.: Geo. E. McClintock and C. A. Adams.
ALBANY HARDWARE & IRON COMPANY, Albany, N. Y.: Chas. H. Turner and Jas. K. Dunscomb.
WEED & CO., Buffalo, N. Y.: Hobart Weed and L. C. Davenport.
BEALS & CO., Buffalo, N. Y.: Pascal P. Beals and Eugene J. McCarthy.
BUFFALO WHOLESALE HARDWARE COMPANY, Buffalo, N. Y.: E. C. Neal.
BARKER, ROSE & CLINTON COMPANY, Elmira, N. Y.: Chester R. Converse, Capt. F. Barker.
IRVING D. BOOTH, Elmira, N. Y.: Irving D. Booth.
UNDERHILL, CLINCH & CO., New York: Frederick E. Underhill and Alfred D. Clinch.
MATTHEWS & BOUCHER, Rochester, N. Y.: J. H. Boucher.
WEAVER, PALMER & RICHMOND, Rochester, N. Y.: Lee Richmond and G. D. Palmer.
BURHANS & BLACK COMPANY, Syracuse, N. Y.: J. W. Black.
WRIGHT-DANA HARDWARE COMPANY, Utica, N. Y.: A. J. Lowery, B. F. Jeffrey.
BABCOCK, HINDS & UNDERWOOD, Binghamton, N. Y.: J. H. Underwood.
TREMAN, KING & CO., Ithaca, N. Y.: R. H. Treman and Fred. L. Hawes.
ODELL HARDWARE COMPANY, Greensboro, N. C.: J. A. Odell, C. H. Ireland and C. H. Ireland, Jr.
MCINTOSH HARDWARE CORPORATION, Cleveland, Ohio; P. S. Harris, G. T. McIntosh, E. O. Rauh.
GEO. WORTHINGTON COMPANY, Cleveland, Ohio: C. A. Jewett, H. H. Rudd and W. D. Taylor.
LOCKWOOD-TAYLOR HARDWARE COMPANY, Cleveland, Ohio: J. Q. Riddle and J. C. Henry.
H. W. LUETKEMEYER & SONS, Cleveland, Ohio: E. H. Luetkemeyer.
KRUSE & BAHLMANN HARDWARE COMPANY, Cincinnati, Ohio: F. Bahlmann.
BOSTWICK-BRAUN COMPANY, Toledo, Ohio: H. L. Thompson, W. W. Knight, F. Lohman.
STOLLBERG HARDWARE COMPANY, Toledo, Ohio: D. R. McChesney.
SUPPLEE HARDWARE COMPANY, Philadelphia, Pa.: W. W. Supplee and J. S. Bonbright.
SHIELDS & BRO., Philadelphia, Pa.: S. F. Wilson, John R. Griffith, Paul A. Griffith, W. K. Wilson, E. T. Griffith and C. F. Griffith.
BIDDLE HARDWARE COMPANY, Philadelphia, Pa.: Chas. M. Biddle, Chas. M. Biddle, Jr., Robert Biddle 2d, Edward Knight, Chas. C. Read and D. H. Reddle.
W. H. & G. W. ALLEN, Philadelphia, Pa.: Henry F. Chorley and W. Allen Barr.
NEWLIN-KNIGHT HARDWARE COMPANY, Philadelphia, Pa.: Wm. E. Dowler, Geo. D. Greening and W. H. Jones.
JAMES M. VANCE & CO., Philadelphia, Pa.: H. Vance Peters.
SELTZER-KLAHR HARDWARE COMPANY, Philadelphia, Pa.: S. Spencer Scott, Thos. Nelson and Walter T. Parsons.
MERCHANT & EVANS COMPANY, Philadelphia, Pa.: Powell Evans, A. J. Cohen, J. A. McKee and Wm. H. Walton.
W. F. POTTS, SONS & CO., INCORPORATED, Philadelphia, Pa.: John P. Balderston, Wm. K. Singleton and Francis C. Bonner.
GUMMEY, MCFARLAND & CO., Philadelphia, Pa.: Wm. T. Gummey, James P. McFarland and Frederick A. Fable.
HALL & CARPENTER, Philadelphia, Pa.: Z. T. Hall.
RITER BROS. COMPANY, Philadelphia, Pa.: C. J. Riter.
CALVERT & HOLLOWAY, Philadelphia, Pa.: P. B. Calvert.
L. D. BERGER, Philadelphia, Pa.: L. D. Berger.
T. JAMES FERNLEY, Philadelphia, Pa.: T. James Fernley and Thos. A. Fernley.
BINDLEY HARDWARE COMPANY, Pittsburgh, Pa.: John Bindley and E. J. Lloyd.
LOGAN-GREGG HARDWARE COMPANY, Pittsburgh, Pa.: P. Lyon Logan and R. M. Repp.
JAMES C. LINDSAY HARDWARE COMPANY, Pittsburgh, Pa.: A. J. Bihler.
WOLFF-LANE HARDWARE COMPANY, Pittsburgh, Pa.: H. G. Darcie.
CONGDON & CARPENTER COMPANY, Providence, R. I.: H. E. Nickerson.
BELCHER & LOOMIS HARDWARE COMPANY, Providence, R. I.: Edward A. Loomis and L. H. Coffin.
UNION HARDWARE & ELECTRICAL SUPPLY COMPANY, Providence, R. I.: C. S. Angell.
C. M. MCCLUNG & CO., Knoxville, Tenn.: Bruce Keener.
ORGILL BROS. COMPANY, Memphis, Tenn.: Joseph Orgill.
F. W. HEITMANN COMPANY, Houston, Texas: F. A. Heitmann.
BARKER-JENNINGS HARDWARE COMPANY, Lynchburg, Va.: O. B. Barker.
W. S. DONNAN HARDWARE COMPANY, Richmond, Va.: John Donnan.
SEATTLE HARDWARE COMPANY, Seattle, Wash.: A. S. Burwell.
JOHN PRITZLAFF HARDWARE COMPANY, Milwaukee, Wis.: John C. Koch.
FREDERICK KRONER HARDWARE COMPANY, La Crosse, Wis.: John C. Kroner.

Sisson & Smalley Company, Belmont, N. Y., has bought out the Hardware and plumbing business of John Nicholson.

Letters from the Trade.

Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.

PERCENTAGE OF PROFIT.

FROM A PROMINENT CANADIAN MERCHANT.—In your issue of October 4 I note the very interesting question of percentage of profit is discussed. I do not quite agree with Mr. Bookkeeper of a foundry company in Pennsylvania in the interpretation of certain points.

Technically, the profits must be based on cost and the percentage of profits fixed according to the class, quality and appearance of the goods, and this is the only proper course.

In practice the percentage of profit may be computed indifferently on the turnover, either on cost or selling values. Provided the expenses are figured on the same basis the results in dollars and cents will be the same. I do not think this is looking backward, for it is only a transposition of figures, with the same results as to amount involved, for nobody would for a moment doubt that dollars and cents is what is looked for in final results. Consequently it should have the precedence over percentage, which is only an accessory. It is a well-known fact that bookkeeping must be made to suit the requirements of business and not business the bookkeeping.

As far as I know it is customary to figure the results of a year's business on the total amount of goods sold at selling prices; but in using this method it is the business of the merchant when pricing goods to apply the following rule:

IF HE WISHES TO REALIZE A PROFIT OF

50 % on selling value he must add 100 % on cost.
40 % on selling value he must add 66⅔ % on cost.
33⅓ % on selling value he must add 50 % on cost.
25 % on selling value he must add 33⅓ % on cost.
20 % on selling value he must add 25 % on cost.
16⅔ % on selling value he must add 20 % on cost.

Your correspondent makes no provision for a percentage of profit to sales and to capital; there is a wide difference in the two. I will explain by an example taken from actual results. A certain concern I know started in business with $418.78. The turnover of the year at selling prices was $29,210.14. The gross profits were $6,822.28, or 23.35 per cent., the cost being $22,387.86. The gross profits were therefore 30.47 per cent. on cost price. The expenses, including interest and bad debts, were $2,286.60, or 7.96 per cent. on sales at selling prices, or 10.21 per cent. on cost. Now let us see if the results are the same.

THE GROSS PROFIT ON

$29,210.14 selling value @ 23.35 % =	*$6,822.28*	
$22,387.86 cost value @ 30.47 % =	*6,822.28*	*$6,822.28*

THE EXPENSES ON

$29,210.14 @ 7.96 % =	*2,286.60*	
$22,387.86 @ 10.21 % =	*2,286.60*	*2,286.60*
Net profit		*$4,535.68*

Therefore the results are the same, the net profit being $4,535.68. Now let us compare this with capital, which was $418.78 at the beginning of business. The result in percentage is 1,120.62 per cent., compared to 15.39 per cent. on selling price of sales, or 20.26 per cent. on cost price of goods sold. Which is right? Both are correct and the horse is not before the cart in any of the ways this problem is figured.

The above statement is surely an evidence and an uncontestable proof that the purchase of a certain amount of goods by a merchant in general business is not an investment. The capital necessary for the general administration of a business is the investment; for capital does not only provide for the purchase of goods but also for carrying the book debts, the increase of stock and meeting the general expenses of administration. If I invest $100 in a business and wait till this amount doubles itself it is true I make 100 per cent. on my capital. This would be the investment, but it would not represent the result of several transactions of buying and selling and the accumulation of profits on each sale; consequently a purchase cannot, properly speaking, be an investment.

To substantiate this I will submit the following example:

A buys $100 worth of goods.
A sells B $50 worth for $75, making a profit of $25.
A purchases $50 worth of goods.
A sells C $75 worth for $125, making a profit of $50.
A sells D balance of stock, $25 worth, for $50, making a profit of $25.

A therefore sold what cost him $150 for $250, realizing a profit of $100, or 100 per cent., on capital; 66 2-3 per cent. on cost and 40 per cent. on selling prices, and all these percentages are correct; hence the different ways, with but one result of a clear profit of $100.

It is therefore evident that the act of buying goods is not what could be termed an investment. The capital placed in the business is the investment.

I hope some other interested parties will send you their views, so that this very important question may be thoroughly studied.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our catalogue department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

FERNALD MFG. COMPANY, North East, Pa.: Catalogue of Anti-Rattlers, Quick Shifts, Trace Holders and other carriage and saddlery specialties.

OSBORN MFG. COMPANY, Cleveland, Ohio: Catalogue No. 121, illustrating and listing an especially complete line of Brushes and Brooms, together with allied foundry supplies and specialties.

NATIONAL SWEEPER COMPANY, Newark, N. J.: Artistic catalogue illustrated in colors referring to National Carpet Sweepers; also price-list.

BOSTROM-BRADY MFG. COMPANY, Madison avenue and Garnett street, Atlanta, Ga.: Catalogues relating to Bostrom's Improved Builders' and Farm Level; also a pamphlet containing a treatise on terracing, draining and ditching.

J. E. PORTER COMPANY, Ottawa, Ill.: Pump catalogue No. 51, illustrating the company's entire line, including Force and Lift, Single and Double Acting, Windmill Regulating Tank and Spray Pumps, as well as Iron, Brass and Brass Lined Cylinders.

HELLER BROTHERS COMPANY, Newark, N. J.: Illustrated catalogue relating to Horse Rasps, Files, Farriers' Tools, Machinists' Hammers. Also catalogue devoted to American Clay Crucible Alloy High Speed Tool Steel, Special Alloy Tool Steel, Extra Tool Steel and Refined File and Rasp Steel.

BUTLER BROTHERS, Chicago: Santa Claus edition of "Our Drummer," comprising nearly 500 pages of general merchandise. A good part of the catalogue is devoted to goods especially adapted for holiday sale, including Cutlery, a very large variety of Toys, imported China and Glassware, Japanese Goods, Games, Christmas Tree Ornaments, Musical Goods, Albums, Fancy Goods, Clocks, Notions and Sundries, &c.

CORBIN CABINET LOCK COMPANY, New Britain, Conn.: Handsome catalogue and price-list covering an extensive line of wrought and cast Padlocks, Chains and selling assortments.

MISCELLANEOUS NOTES.

Remington Autoloading Rifle.

The Remington Arms Company, 313-315 Broadway, New York, M. Hartley Company, sole representative, is arranging to put on the market by January 1 additional calibers of the new 0.35 Remington autoloading rifle, recently illustrated in these columns. This rifle, which is referred to by the manufacturer as "big enough for the

biggest game," is a take down, fast shooting, hard hitting, modern sporting, five-shot repeating rifle, the new calibers of which will be 0.25-35, 0.30-30 and 0.32. The cartridges will be furnished with metal cased and soft point bullets.

The Dikeman Mfg. Company.

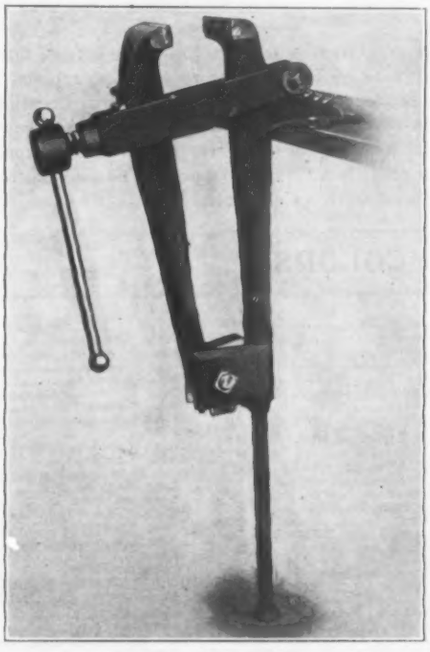
The Dikeman Mfg. Company, Norwalk, Conn., makes a business of making specialties for other parties in the line of mechanics' tools and other light hardware. The company is also in a position to furnish parts of other specialties, such as are made on screw machines, presses, &c.

George W. Dover Company.

George W. Dover Company, 80 Clifford street, Providence, R. I., is a specialty house and work on special order goods. The company manufactures special screw machine products in brass only from 1 in. down. The company also does designing and die cutting, and produces special turned pieces in brass and sterling silver.

Snediker's Rapid Blacksmith's Leg Vise.

Peter A. Frasse & Co., 92-94 Fulton street, New York, are now manufacturing at their Yonkers, N. Y., factory Snediker's rapid blacksmith leg vise here shown, which has been improved in several respects, since originally described in these columns. It may be opened or closed to extremes instantly, and can be adjusted to any diameter of work by a single turn of the screw. The double sliding rack bar of steel, now kept in correct position by upper and lower front lugs, leaves a clear opening between the jaw centers, so that long material, bolts, rods, &c., for example, can be firmly gripped in a vertical position; there being no long horizontal screw exposed to clogging by filings and dirt. The short adjusting screw is capable of powerful operation against the front jaw.



Snediker's Improved Rapid Blacksmith's Leg Vise.

The connecting strap has a stationary pawl in the rear end that articulates with the teeth so that work can be quickly engaged at any point. The coil steel spring at the base of the jaw members automatically throws the front jaw forward and against the material to be held when released by the hand, and is protected from falling accumulations of matter. Owing to this construction the front jaw has less lateral motion and holds more rigidly than is possible with the customary box and long screw design. The steel jaw faces, another improvement, are interchangeable; said by the manufacturers to be found only in this make of leg vise. The strains on the screw are always direct regardless of the size of work held, thereby eliminating side wear on the screw. The strap straddling the front jaw permits of having the entire front jaw of solid cast steel instead of weakening it by cutting away metal for the passage of a large screw through it. The vise is made in 12 sizes, numbered 35, 40, 45, 50, 55, 60, 70, 80, 90, 100, 150 and 180, the jaws ranging from 3¾ to 8 in. wide. This house has also recently taken over the manufacture of Snediker's rapid bench vises, and the complete line of Stephen's patent quick action vises.

Humphrey Oval Gas Heater.

Humphrey Company, Kalamazoo, Mich., manufacturer of water heaters, &c., is putting on the market the gas heater here shown, which differs in many respects from other articles of its kind. The feature of the stove is that it can be used either for heating or cooking, as the oval top can be lifted off, exposing the flat plate close to the burner, on which to set a kettle or dish. Although made

Fig. 1.—Humphrey Oval Gas Heater.

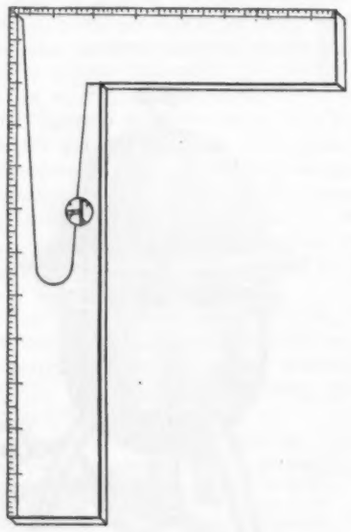
without nuts, bolts or screws, it can be entirely taken apart and put away so as to occupy very little room. A sectional view of the stove, with the top in place, is shown in Fig. 2, from which the method of putting it together and its design for diffusing heat will be understood. Air is taken in through the perforations in the bottom, heated and forced out at the sides instead of

Fig. 2.—Humphrey Heater, Sectional View.

directly upward, thus tending to spread the warm air through the room instead of allowing it to rise directly to the ceiling. The heating efficiency is greatly increased by the air chamber in the top, into which the air enters through the perforations in the lower rim, escaping heated through other perforations near the top. The device is finished in polished nickel, stands 16 in. high and weighs 4½ lb. Its retailing price is $2.50.

An Improved Steel Square.

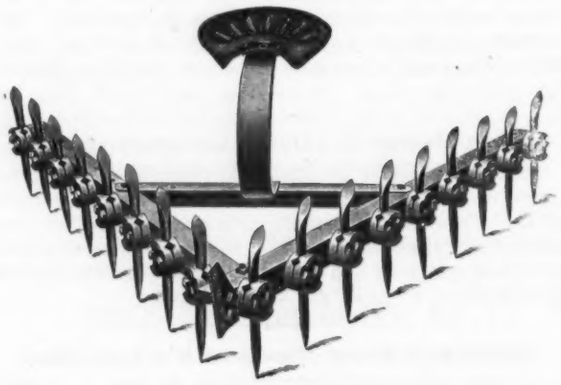
An improved construction of the well-known carpenters' framing square and having detachable members which adapt it for being "knocked down" when not in use, thus rendering it easy to pack in the mechanic's tool box, is put on the market by Rankin & Scroggins, 28 to 32 Tenth street, Wheeling, W. Va., and is illustrated herewith. The device is simple in construction, and convenient and durable in operation. It can be used for any purpose for which the ordinary carpenter's square can be employed, and is of the same size. The point is made that it is without the disadvantage of the ordinary folding squares on the market, as it will lay perfectly flat on either side, having no projections whatever. The square has different scales on one side—namely, ¼ in., ½ in., ¾ in., 1½ in. and 3 in. to the foot, thereby making it convenient for use in laying out details, for by taking the square apart the mechanic has a 24-in. straight edge, with the scales arranged in convenient manner for work. The square is covered by United States and Canadian patents.



An Improved Steel Square.

Oran's Adjustable A Harrow with Seat.

The harrow shown herewith has a steel frame, and can be quickly adjusted to cut any width from 2½ to 5 ft. per section. By coupling two sections side by side a 10-ft. cut may be obtained, and by coupling together two sections—one directly behind the other—harrowing, smoothing and pulverizing the soil is simultaneously accomplished at a single trip. The teeth have sharp points at one end and a cultivating point on the other to make the implement as useful for cultivating as for ordinary harrowing. The harrow is especially valuable in the cultivation of corn, cotton or any crop planted in rows, as it can be readily adjusted to pass between rows. The harrow frame is made of ¼ x 2½ in. angle steel, and the teeth are of high carbon steel 3 in. square and 13 in. long. The implement is equipped with a steel handle or with a spring seat and handle, as may be desired. The harrow has recently been perfected and is offered by the Harriman Mfg. Company, Harriman, Tenn.



Oran's Adjustable A Harrow with Seat.

George A. Graves & Sons, 324 Main street, Springfield, Mass., are to erect a four-story brick storehouse 50 x 55 ft. in the rear of their store. The firm because of the rapid growth of its business has become so cramped for room in its present quarters that it has become necessary to provide additional space. The new building will be equipped with an elevator.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal.	
Linseed, City, raw		.39 @40
City, Boiled		.40 @41
State and Western, raw		.38 @39
Raw Calcutta, in bbls		.. @..
Lard, Extra Prime, Winter		.74 @75
Extra No. 1		.45 @46
No. 1		.40 @44
Cotton-seed Crude, f.o.b. mills		.29 @30
Summer Yellow, Prime		.37½@38
Summer Yellow, off grades		.. @..
Sperm, Crude		.53 @..
Natural Spring		.. @..
Bleached Spring		.. @..
Natural Winter		.63 @65
Bleached Winter		.66 @67
Bleached Winter, Extra		.68 @69
Tallow, Prime		.52 @54
Whale, Crude		.32 @33
Natural Winter		.43 @44
Bleached Winter		.45 @46
Extra Bleached Winter		.47 @48
Menhaden, Brown, Strained		.26 @29
Light, Strained		.27 @30
Bleached, Winter		.. @..
Extra Bleached, Winter		.. @..
Southern		.21 @..
Cocoanut, Ceylon	₱ lb	8¼@..
Cochin	₱ lb	.. @ 9¼
Cod, Domestic, Prime		.30 @33
Newfoundland		.35 @37
Red, Elaine		.38 @42
Red, Saponified	₱ lb	5½@ 5⅞
Olive, Italian, bbls		.58 @60
Neatsfoot, Prime		.48 @49
Palm, Logos	₱ lb	.. @ 6⅝

Mineral Oils—

	₱ gal.	
Black, 29 gravity, 25@30 cold test		10½@11½
29 gravity, 15 cold test		11½@12½
Summer		10½@11½
Cylinder, light filtered		.18 @19
Dark filtered		.16 @17
Paraffine, 903-907 gravity		13½@14
903 gravity		12½@13
883 gravity		10¼@10⅝
Red		12½@14

Miscellaneous—

Barytes:		
White, Foreign	₱ ton	$18.50@20.00
Amer. floated	₱ ton	19.00@.....
Off color	₱ ton	11.50@15.50
Chalk, in bulk	₱ ton	3.00@ 3.25
In bbls	₱ 100 lb	....@ .35
China Clay, English	₱ ton	11.00@17.00
Cobalt, Oxide	₱ 100 lb	2.50@ 2.60
Whiting, Commercial	₱ 100 lb	.43@ .48
Gilders	₱ 100 lb	.50@ .55
Ex. Gilders	₱ 100 lb	.55@ .60

Putty, Commercial—₱ 100 lb

In bladders	$1.70 @1.85
In bbls. or tubs	1.20 @1.40
In 1 lb to 5 lb cans	2.65 @2.95
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—₱ gal.

In Oil bbls	.69 @69½
In machine bbls	.63½@70

Glue—

	₱ lb	
Cabinet		.11 @15
Common Bone		.7 @ 9
Extra White		.18 @24
Foot Stock, White		.11 @14
Foot Stock, Brown		.8 @11
German Hide		.12 @18
French		.10 @40
Irish		.13 @16
Low Grade		.9 @12
Medium White		.14 @17

Gum Shellac—

	₱ lb	
Bleached Commercial		.47 @48
Bones, Dried		.57 @69
Button		.40 @50
Diamond I.		.53 @55
Fine Orange		.50 @52
A. C. Garnet		.47 @47½
Kala Button		.37 @38
G. A. L. Garnet		.45 @45½
D. C.		.55 @68
Octagon B		@53½
T. N.		.48½@50
V. S. O.		.54 @55

Colors in Oil—

	₱ lb	
Black, Lampblack		.12 @14
Blue, Chinese		.36 @46
Blue, Prussian		.32 @36
Blue, Ultramarine		.13 @16
Brown, Vandyke		.11 @14
Green, Chrome		.12 @16
Green, Paris		.. @24
Sienna, Raw		.12 @15
Sienna, Burnt		.12 @15
Umber, Raw		.11 @14
Umber, Burnt		.11 @14

White Lead, Zinc, &c.—

	₱ lb	
Lead, English white, in Oil		9¾@10
Lead, American white, in Oil:		
Lots of 500 lb or over		.. @ 7¼
Lots less than 500 lb		.. @ 7¾
In Barrels		.. @ 6¾
Lead, White, in oil, 25 lb tin pails, add to keg price		.. @ ½
Lead, White, in oil, 12½ lb tin pails, add to keg price		.. @ 1
Lead, White, in oil, 1 to 5 lb ass'ted tins, add to keg price		.. @ 1½

Lead, American, Terms: For lots 12 tons and over ¼¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.

	₱ lb	
Lead, White, Dry, in bbls		6½@ 6¾
Zinc, American, dry		5¾@ 5½
Zinc, French:		
Antwerp, Red Seal, dry		8¾
Antwerp, Green Seal, dry		10¾
Paris, Red Seal, dry		9¼
Paris, Green Seal, dry		11

Zinc, V. M. French, in Poppy Oil:

Green Seal:	
Lots of 1 ton and over	13½@13⅝
Lots of less than 1 ton	13⅝@13⅞
Zinc, V. M. French, in Poppy Oil:	
Red Seal:	
Lots of 1 ton and over	11⅞@12⅜
Lots of less than 1 ton	12⅛@12⅝

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1⅞; 25 bbls., 2⅜; 50 bbls., 4⅞.

Dry Colors—

	₱ lb	
Black, Carbon		.5 @10
Black Drop, American		.4 @ 6
Black Drop, English		.5 @15
Black, Ivory		.16 @20
Lamp, Coin		4½@ 6
Blue, Celestial		.4 @ 6
Blue, Chinese		.29 @32
Blue, Prussian		.27 @30
Blue, Ultramarine		4½@15
Brown, Spanish		.½@ 1
Carmine, No. 40		$3.00@3.05
Green, Chrome, ordinary		3½@ 6
Green, Chrome, pure		.17 @25

Lead, Red, bbls., ½ bbls. and kegs:

Lots 500 lb or over	.. @ 7¼
Lots less than 500 lb	.. @ 7¾
Litharge, American, bbls	7¼@ 7¾
Ocher, American	₱ ton $8.50@16.00
American Golden	2½@ 3½
French	1¾@ 2½
Foreign Golden	3 @ 4
Orange Mineral, English	.10 @12
French	10¾@12
German	8½@10
American	8½@ 8¾
Red, Indian, English	4½@ 8½
American	3 @ 3¼
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer.	₱ 100 lb $0.50@1.25
English	100 lb $1.15@1.75
Sienna, Italian, Burnt and Powdered	3 @ 9½
Italian, Raw, Powdered	3 @ 6½
American, Raw	1½@ 2
American Burnt and Pow	1½@ 2
Talc, French	₱ ton $17.00@25.00
American	₱ ton 17.00@25.00
Terra Alba, French	₱ 100 lb .90@ 1.00
English	₱ 100 lb .80@ 1.00
American	₱ 100 lb, No. 1, .75@ .80
American	₱ 100 lb, No. 2, .60@ .65
Umber, Turkey, Bnt. & Pow	2½@ 3½
Turkey, Raw and Powdered	2½@ 3½
Burnt, American	1½@ 2
Raw, American	1½@ 2
Yellow Chrome	.12 @14
Vermilion, American Lead	.10 @25
Quicksilver, bulk	.65 @..
Quicksilver, bags	@66
English, Imported	.65 @70
Chinese	$0.90@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1906, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, ℔ doz. $3.00.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition— See *Caps, Cartridges, Shells, &c.*

Anti-Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, ℔ doz. pairs, Nos. 1, $0.75; 2, $0.60; 4, $1.00; 5, $0.50.
Fernald Quick Shifter, ℔ doz. pairs .....$2.00@$3.00

Anvils—American—

Eagle Anvils.....℔ lb 7 @7¼ ¢
Hay-Budden, Wrought.....9½@9¾ ¢
Trenton .....℔ lb 9½@9¾ ¢

Imported—

Peter Wright & Sons, ℔ lb, 84 to 349 lb, 11¢; 350 to 600 lb, 11½¢.

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers— See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....33⅓%

Augers and Bits—

Com. Double Spur.....75@75&5%
Jennings' Patn., reg. finish.....50&10@60%
Black Lip or Blued.....60&10%
Boring Mach. Augers.....70&10%
Car Bits, 12-in. twist.....50&10%
Ford's Auger and Car Bits.....40&5%
Ft. Washington Auger Co., Conrad's 35%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list..25%
No. 30, R. Jennings' list.....40&7½%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60%
Snell's King Auger Bits.....50%
Wright's Jennings' Bits.....50%

Bit Stock Drills— See *Drills, Twist.*

Expansive Bits—

Clark's small, $18; large, $26...50&10%
Clark's Pattern, No. 1, ℔ doz. $26; No. 2, $18.....60&10&10%
Ford's, Clark's Pattern.....60%
C. E. Jennings & Co., Steer's Pat..25%
Lavigne Pat., small size, $18.00; large size, $26.00.....70&10%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.75; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz..$5.50@6.00
Ames .....25&10%
Universal 20%
Wood's Universal.....25%

Ship Augers and Bits—

Ship Augers.....45&5@—%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 15%
Watrous' .....33⅓&7½%
Snell's 40%

Awl Hafts— See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdled, Shldered..gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. $1@1.1¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights: Per doz.
First Quality.....$4.75@5.00
Second Quality.....$4.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles— *Iron or Steel*

Concord, Loose Collar...4¼@4½¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose...3¼@3¾¢
No. 1½ Com., New Style3¾@4¼¢
No. 2 Solid Collar.....4@4½¢
Half Patent:
Nos. 7, 8, 11 and 12....75@75&5%
Nos. 13 to 14.....70&10@75&5%
Nos. 15 to 18...75&10@75&10&5%
Nos. 19 to 22...75&10@75&10&5%

Boxes, Axle—

Common and Concord, not turned lb., 4½@5¢
Common and Concord, turned. lb., 5½@6¢
Half Patent.....lb., 8¼@9¢

Bait— Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances— Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chatillon's:
Light Spg. Balances.....50&10%
Straight Balances.....40@50%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb.... per lb., 3@3½¢

Towel

No. 10 Ideal, Nickel Plate..℔ gro. $8.50

Beams, Scale—

Scale Beams.....40&5@40&10%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 13 Wire Tinned ℔ doz.....$0.75
No. 12 Wire Coppered ℔ doz, $0.75; Tinned $0.85
No. 11 Wire Coppered ℔ doz. $1.10; Tinned $1.20
No. 10 Wire Galvanized..℔ doz. $1.50
Western W. G. Co.:
No. 1 Electric.....℔ gro. $7.80
No. 2 Buffalo.....℔ gro. $9.00
No. 3 Perfection Dust.....℔ gro. $8.00

Egg—

Holt-Lyon Co.:
Holt, per doz., No. 5, $0.80; No. 1, Jap'd, $1.15; No. 1, Tin'd, $1.40; No. B, Jap'd, $1.85; No. 2, Tin'd, $2.25; No. 6, $1.60.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dever, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover.....$6.00
Western, W. G. Co., ℔ gro., Buffalo, No. 2, $8.00; Perfection, No. 3, $9.00.
Wonder (R. M. Co.)..℔ gro. net, $6.25

Bellows—

Blacksmith, Standard List.. 60@60&10%

Hand—

Inch..	*6*	*7*	*8*	*9*	*10*
Doz..	*$4.75*	*5.70*	*6.65*	*7.60*	*8.85*

Molders—

Inch..	*9*	*10*	*11*	*12*	*14*
Doz..	*$8.00*	*9.00*	*10.50*	*12.50*	*14.50*

Net Prices.

Bells— Cow—

Ordinary Goods...75&5@75&10&5%
High grade.....70&10@75%
Jersey .....75&10%
Texas Star.....50%

Door—

Abbe's Gong.....45%
Barton Gong.....50%
Home, R. & E. Mfg. Co.'s.....55&10%
Trip Gong.....50&10@50&10&5%
Yankee Gong.....55%

Hand—

Polished, Brass.....60&10%
White Metal.....60%
Nickel Plated.....50&10@60%
Swiss .....50&10@50&10&5%
Cone's Globe Hand Bells.....33⅓@35%
Silver Chime.....33⅓@35%

Miscellaneous—

Farm Bells.....lb., 2¼@2½¢
Church and School.....60%
American Tube & Stamping Co. Gongs 75%
Table Call Bells.....50@50&10%

Belting— Leather—

Extra Heavy, Short Lap..65&5%
Regular Short Lap....60&10&5%
Standard 70%
Light Standard.....70&5%
Cut Leather Lacing.....45%
Leather Lacing Sides, per sq. ft. 25¢

Rubber—

Agricultural (Low Grade)..... 75@75&5%
Common Standard....70@70&10%
Standard .....60&5@60&10%
Extra .....60@60&5%
High Grade.....50&5@50&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....40%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.50.
Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1906 list: Chain, Parts, Spokes.....50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—

Common Wooden.....75%
Hartz St. Tackle Blocks.....50@50&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty, Mal. Iron.....50%
Stowell's Loading.....50&10%
See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c.....40%
Paper Embossed.....40&10%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread): ⅝ × 6 and smaller.....75@—%
Larger and Longer..... 60&10@60&10&5%
Phila. Eagle $3.00 list May 2½,'99 40%
Bolt Ends.....65@65&5%
Machine, ⅝ x 4 and smaller.. 75@—%
Machine, larger and longer.. 65@65&5%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz..	*$1.30*	*.35*	*.45*	*.60*	*.80*

Cast Iron Spring Foot, Jap'd:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.20*	*1.50*	*2.25*

Cast Iron Chain, Flat, Japanned:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.00*	*1.40*	*1.85*

Cast Iron Flat Shutter, Jap'd., Brass Knobs:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.75*	*.95*	*1.25*

Wrought Barrel Japd..80@80&10%
Barrel Bronzed.....50@50&10%
Spring .....70&10@70&10&10%
Shutter .....50&5@50&10&5%
Square Neck.....75@75&10%
Square ...66⅔&10@66⅔&10&10%
Ives' Patent Door.....50%

Plow and Stove—

Plow .....60&10@—
Stove .....82½&10

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99.....80%
Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '84....80%
Eagle Phila., list Oct. 16, '84....82½%
Mount Carmel, list Dec. 28, '99...80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84.....80%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch.....	*1¼*	*1½*	*1¾*	*2*
Per doz...	*$4.80*	*5.60*	*6.40*	*8.00*
Inch	*2¼*	*2½*		
Per doz.....	*$8.65*	*11.50*		

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....30%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme .....15&10%
Perfection 40%
Seavey 40%
Stanley R. & L. Co.: Nos. 240 to 460, 30%; Nos. 50 and 60.....35%

Braces—

Common Ball, American. $1.25@1.50
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat.60@60&5%
Stanley R. & L. Co.:
Stanley, 35%; Victor.....45%

Brackets—

Wrought Steel.....80@80&5%
Griffin's Pressed Steel.....75&10@80%
Griffin's Folding Brackets.....70&10%
Stowell's Cast Shelf, 75%; Sink...50%
Western, W. G. Co., Wire.....60&10%

Bright Wire Goods— See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Western, W. G. Co.....80%
Wire Goods Co.....75@75&10%

Buckets, Galvanized—

Price per dozen.

Quart.....	*10*	*12*	*14*
Water, Regular...	*1.40*	*1.70*	*1.90*
Water, Heavy....	*3.40*	*3.70*	*3.80*
Fire, Rd. Bottom..	*2.30*	*2.55*	*2.95*
Well	*2.55*	*2.87*	*3.15*

Bucks, Saw—

Hoosier.....℔ gro. $36.00

Bull Rings—See *Rings, Bull*

Butts— Brass—

Wrought, list, Sept., '96..15@—%
Cast Brass, Tiebout's.....50%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel—

	Discount.
Reversible and Broad	*75&5%*
Light Reversible, Light Narrow	*75&10%*
Loose Joint, Narrow, L't Inside Blind, etc.	*75%*
Back Flaps, Table, Chest.	*70&10%*

Butts, Wrought Steel, Net Prices.

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, 10%; 1200, 25%; 200, 300, 600, 900 .....40%
Hendryx Bronze: Series 700, 800..40%
Hendryx Enameled.....40%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong....per lb., 4¼¢
Sharp, 1 prong...per lb., 4½@4¾¢
Burke's Blunt, 4@4¼¢; Sharp, 4½@4¾¢
Gautier, Blunt, 4@4¼¢; Sharp, 4½@4¾¢
Perkins', Blunt, ℔ lb, 3.65¢; Sharp, 4.15¢

Can Openers—
See *Openers, Can.*

Cans, Milk—

	5	8	10 gal.
Illinois Pattern	$1.35	1.85	2.05 each.
New York Pattern	1.50	2.20	2.45 each.
Baltimore Pattern	1.50	2.20	2.45 each.
Dubuque	1.35	1.60	1.75 each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$18.00	60.00	129.60 gro., net.

Caps, Percussion—

Eley's E. B.....52@55¢
G. D.....per M 34@35¢
F. L.....per M 40@42¢
G. E.....per M 48@50¢
Musket.....per M 62@63¢

Primers—

Berdan Primers, $2 per M...20%
B. L. Caps (Sturtevant Shells) $2 per M.....20%
All other primers per M.$1.52@1.60

Cartridges—

Blank Cartridges:
32 C. F., $5.50.....10&5%
38 C. F., $7.00.....10&5%
22 cal. Rim, $1.50.....10&5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con. Ball, Swgd..$1.90
B. B. Caps, Round Ball....$1.49
Central Fire.....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets.15&10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15&5%

Casters—

Bed.....70@70&10%
Plate.....60&10@60&10&5%
Philadelphia.....75@75&10%
Acme, Ball Bearing.....33⅓%
Boss.....70&10%
Boss Anti-Friction.....70&10%
Gem (Roller Bearing).....80%
Martin's Patent (Phoenix).....45%
Standard Ball Bearing.....45%
Tucker's Patent low list.....30%
Yale (Double Wheel) low list.....50%

Cattle Leaders—
See *Leaders, Cattle.*

Chain, Coil—

American Coil, Straight Link:

3-16	¼	5-16	⅜	7-16	½	9-16
$5.70	5.20	4.95	4.20	4.05	3.95	3.90
⅝	¾	⅞ to 1	1⅛ to 1¼ inch.			
$3.85	3.70	3.65	3.80			

German Coil.....60&10&10@70%

Halter—

Halter Chains.....60&5@60&10%
German Pattern Halter Chains, list July 2½, '97.....60&10&10%
Covert Mfg. Co. Halter.....35&5%

Cow Ties—
See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, Str'ght, with ring..$25.00
6½—6-2, Str'ght, with ring..$26.00
6½—8-2, Str'ght, with ring..$30.00
6½—10-2, Str'ght, with ring..$35.00
NOTE.—Add 2c per pair for Hooks. Twist Traces; add per pair for Nos. 2 and 3, 2c; No. 1, 3c; No. 0, 4c to price of Straight Link.
Eastern Standard Traces, Wagon Chain, &c.....60&10%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron.....60&10%
Brass.....60&10%
Safety Chain.....70&10%
Gal. Pump Chain.....lb. 4@4½%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion.....40%
Oneida Community:
Am. Dog Leads and Kennel Chains, 40@40&5%
Niagara Dog Leads and Kennel Chains.....45@60&5%
Wire Goods Co.:
Dog Chain.....70&10%
Universal Dbl.-Jointed Chain.....50%

Chain and Ribbon, Sash—

Oneida Community:
Copper Chain, 60&5%; Steel Chain, 60%
Pullman:
Bronze Chain, 60%; Steel Chain, 60&10%
Sash Chain Attachments, per set..8¢
Aluminoy Sash Ribbon, per 100 ft.....$1.25@$3.00
Sash Ribbon Attachments, per set..8¢

Chalk—(From Jobbers.)

Carpenters' Blue....gro., 45@—¢
Carpenters' Red....gro., 40@—¢
Carpenters' White...gro., 35@—¢
Some jobbers sell at lower prices than above.

Checks, Door—

Bardsley's.....45%
Pullman, per gro.....$54.00
Russwin.....40%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....55%
Youths' Chests, with Tools.....40%
Gentlemen's Chests, with Tools..30%
Farmers', Carpenters,' etc., Chests, with Tools.....20%
Machinists' and Pipe Fitters' Chests, Empty.....50%
Tool Cabinets.....50%
C. E. Jennings & Co.'s Machinists' Tool Chests.....33⅓&10%

Chisels—

Socket Framing and Firmer

Standard List..75&10@75&10&5%
Buck Bros.....30%
Charles Buck Edge Tool Co.....30%
C. E. Jennings & Co.:
Socket Firmer No. 10.....60%
Socket Framing No. 15.....60%
Swan's.....75%
L. & I. J. White Co.....30@30&5%

Tanged—

Tanged Firmers.....33 1-3@40%
Buck Bros.....30%
Charles Buck Edge Tool Co.....30%
C. E. Jennings & Co. Nos. 191, 181..25%
L. & I. J. White Co.....25&5%

Cold—

lb.
Cold Chisels, good quality..13@15¢
Cold Chisels, fair quality..11@12¢
Cold Chisels, ordinary...9@10¢

Chucks—

Almond Drill Chucks.....35%
Almond Turret Six-Tool Chuck.....35%
Beach Pat., each $8.00.....35&5%
Empire.....25%
Blacksmiths'.....25%
Jacobs' Drill Chucks.....35%
Pratt's Positive Drive.....25%
Skinner Patent Chucks:
Independent Lathe Chucks.....40%
Universal, Reversible Jaws.....40%
Combination, Reversible Jaws.....40%
Drill Chucks, New Model, 25%; Standard, 40&10%; Skinner Pat., 25%; Positive Drive.....40%
Planer Chucks.....30%
Face Plate Jaws.....40%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21.....35%
Scroll Combination, Nos. 82 and 84.....30%
Geared Scroll, Nos. 33, 34 and 35..35%
Independent Iron, Nos. 18 and 318.40%
Independent Steel, No. 64.....30%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104.....35%
Union Czar Drill.....25%
Universal 11, 12, 16, 17, 13, 14, 15..40%
Universal, No. 42.....35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50.....40%
Steel Face Plate Jaws, Nos. 70 and 72.....35%
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved.....50%
Oneida Drill.....50%
Scroll Combination Lathe.....50%

Clamps—

Adjustable, Hammers'.....20@20&5%
Carriage Makers', P., S. & W. Co.....40&10@50%
Besly, Parallel.....33⅓&10%
Lineman's, Utica Drop Forge & Tool Co.....40%
Wood Workers, Hammers'.....40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable.....55%
Iwan's Champion, Stationary.....45%

Sidewalk—

Star Socket, All Steel..℔ doz. $4.05 net
Star Shank, All Steel..℔ doz. $3.24 net
W. & C. Shank, All Steel, ℔ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros.....30%
Fayette R. Plumb.....30%
L. & I. J. White Co.....30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
'96 Chicago Horse, each...$8.75
1902 Chicago Horse, each..$10.75
20th Century Horse, each..$5.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each.$20.00
Stewart's Enclosed Gear Horse, each.....$6.75
Stewart's Patent Sheep Shearing Machine, each.....$12.75
} 25%

Clips, Axle—

Regular Styles, list July 1, '05.80%

Cloth and Netting, Wire—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c.....70%
Compression Bibbs.....65&10%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list.....40%
Leather, Walter B. Stevens & Son's list.....40%

Combs, Curry—

Metal Stamping Co.....40%

Compasses, Dividers, &c.

Ordinary Goods.....70&10@75%
Bemis & Call Hdw. & Tool Co.:
Dividers.....65%
Calipers, Double, 65%; Inside or Outside.....65%
Calipers, Wing.....60%
Compasses.....50%
Wm. Schollhorn Co.:
Excelsior Dividers.....55%
Lodi Dividers.....75%

Conductor Pipe,—

L. C. L. to Dealers:

	Galvanized		
	Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
Eastern:			
	60&30%	*60&2½%*	*30&10&2½%*
Central:			
	70%	*55&7½%*	*30&10%*
Western and Southern:			
	65&10%	*55&2½%*	*30&7½%*
So. Western			
	62½&7½%	*50&5%*	*30&5%*

Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

Gal. each..	2	3	4	6	8
Labrador	$1.20	$1.50	$1.80	$2.10	$2.70
Gal.	3	4	6	8	
Iceland, ea.	$1.80	$2.10	$2.40	$3.00	
Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles, Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled, 25%; Agate Lined, 25%

Coopers' Tools—
See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier, 23¢; lighter than 3 lb. to pair.....25¢

Cord—Sash—

Braided, Drab.....lb. 35¢
Braided, White, Com., Nos. 8 to 12, 2½¢; No. 7, 2½@2¾¢; No. 6, 2½@3¢.
Cable Laid Italian.....lb., A, 18¢; B, 16¢
Common India.....lb. 10@10½¢
Cotton Sash Cord, Tw'ted..17@19¢
Patent Russia.....lb...@14¢
Cable Laid Russia.....lb...@15¢
India Hemp, Br'd'd..lb. 18@18½¢
India Hemp, Twisted..lb. 12@13¢
Patent India, Twisted..lb. 12@13¢
Anniston Cordage Co.: ℔ lb. solid Braided, Nos. 8 to 12, $0.24; No. 7, $0.24½; No. 6, $0.25½; ℔ doz., 50 ft., Oriole, $2.00; 50 ft., Columbia, $0.85; 50 ft., Victors, $1.00; 50 ft., 6-Thread, $1.10; 60 ft., 3-Thread, $0.95; 50 ft., Manila, $1.40; 60 ft., Jute, $0.75.
Pearl Braided, cotton, No. 6, ℔ lb., 25½¢; No. 7, 25¢; Nos. 8 to 12, 24½¢
Eddystone Braided, Nos. 8, 9 and 10, 25¢; 7, 25½¢; 6, 26½¢.
Harmony Cable Laid Italian, Nos. 7 to 10.....℔ lb 25 ¢
Pullman:
Wire Sash Cord.....19%
Sash Cord Attachments, per doz.10¢
Samson, Nos. 8 to 12:
Braided, ℔ lb., Drab Cotton, 55¢; Italian Hemp, 40¢@50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord.....50¢
Massachusetts, White....℔ lb 40¢
Massachusetts, Drab.....℔ lb 45¢
No. 7, 28¢; No. 6, 30¢.
Phoenix, White, Nos. 8 to 12, 27¢;
} 15&10%
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen....57½¢
See also Chain and Ribbon.

Wire, Picture—

List July 10, 1906...85&10&10@—
Hendryx Standard Wire Picture Cord, old list, 85&10%

Cradles—

Grain.....40&12½%

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but lower prices made by jobbers
Zelnicker's Lumber, ℔ gro. White and Purple, Indelible....$7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black.....$4.00
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round, $2.50; 5 in. x ¼ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 3-16.....$3.00

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $7.00; Light.....$6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden.....50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, ℔ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....℔ doz. $3.00
Wm. Rogers & Son.....℔ doz. $2.50

Cutters—Glass—

H. H. Mayhew Co.....40%
Red Devil.....50%
Smith & Hemenway Co.....50%
Woodward.....40%

Meat and Food—

American.....30%

Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$60

Enterprise:

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$4.50	$6

25@25&7½%
No. 202, $1.50.....40&7½%
Dixon's.....℔ doz. 30@30&5%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal.....40@40&5%
Little Giant.....℔ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

N. E. Food Choppers.....25%
New Triumph No. 605, ℔ doz. $24.00.. 40@50%
Russwin Food, No. 1, $24.00; No. 2, $27.00.....45&10&10%
Woodruff's.....℔ doz. 30@30&5%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers.....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters, Corn Graters, &c.....35%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....℔ doz. $3.00
Combined Slaw Cutter and Corn Grater.....℔ doz. $4.00
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife..℔ gr. $18@$20
Slaw Cutters, 2 Knife..℔ gr. $22@$30

Tobacco—

All Iron, Cheap..doz. $4.25@$4.50
Enterprise.....25@30%
National, ℔ doz., No. 1, $21; No. 2, $18.....40%

Diggers, Post Hole, &c.—

Disston's:
Rapid, ℔ doz., $24.00.....25%
Samson, ℔ doz., $34.00.....25%
Iwan's Imp'ved Post Hole Auger.40&5%
Vaughan Pattern Post Hole Augers, ℔ doz., $6.25
Perfection Post Hole Diggers, ℔ doz.....$8.25
Split Handle Post Hole Diggers, ℔ doz. $7.25
Kohler's, ℔ doz., Universal, $14.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.00; Pioneer.....$7.00
Never-Break Post Hole Diggers, ℔ doz., $24.00.....60%

Dividers—See *Compasses.*

Drawers, Money—

Tucker's Pat. Alarm Till No. 1, ℔ doz., $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—
See *Knives, Drawing.*

Dressers, Emery Wheel—

Diamond Emery Wheel Dressers....35%
Diamond Wheel Dresser Cutters....35%

Drills and Drill Stocks—

Blacksmiths' Common Drilling Machines.....$1.50@$1.75
Breast, Millers Falls.....15&10%
Breast, P., S. & W.....40%
Goodell Automatic Drills..40&5@40&10%
Johnson's Automatic Drills, Nos. 2 and 3.....16⅔%
Johnson's Drill Points.....16⅔%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's, 40%; Weston's..40%
Ratchet, Weston's, Style H Improved.....40%
Ratchet, No. 012.....40%
Ratchet, Celebrated.....40%
Ratchet, Whitney's, P., S. & W..50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—

Bit Stock.....60&10&10@70%
Taper and Straight Shank.....60&10@60&10&5%

Drivers, Screw—

Screw D'ver Bits, per doz..45@50¢
Balsey's Screw Holder and Driver, ℔ doz., 2½-in., $6; 4-in., $7.50; 6-in., ℔.....50%
Buck Bros.' Screw Driver Bits.....30%
Champion.....50%
Disston's.....70%
Edson.....60%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Ford's Brace Screw Drivers...40&10%
Gay's Double Action Ratchet.....35%
Goodell's Auto..50&10&10@50&10&10&5%
Hurwood.....40%
Mayhew's Black Handle.....40%
Mayhew's Monarch.....40&10%
Millers Falls, Nos. 20 and 21...25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
New Eng'and Specialty Co.....50&10%
Smith & Hemenway Co., Never-turn, 40&5%; Elmora.....50%
H. D. Smith & Co.'s Perfect H'dle.40%
Stanley R. & L. Co.'s:
No. 64, Varn. Handles, 65%; No. 86, 75%; Victor, 55%; Defiance..70%
Swan's:
Nos. 7565 to 7568, 50%; No. 7540, 40&10%

Eave Trough, Galvanized—

	Territory. Galv. Steel.	*L. C. L. Galvanized Charcoal Iron.*	*Copper. 14, 16&20 oz.*
Eastern:			
	80%	*70&5%*	*30&10&2½%*
Central:			
	75&10&7½%	*70%*	*30&10%*
Western and Southern:			
	70&20&7½%	*60&15&2½%*	*30&7½%*
So. Western:			
	70&20%	*65&2½%*	*30&5%*

Terms.—2% for cash. Factory shipments generally delivered.
See also Conductor Pipe and Elbows

Elbows and Shoes—

Factory shipments, all territories:
Galv. Steel and Galv. C. I.
Standard Gauge.....60&10%
No. 26.....50%
No. 24.....25%
No. 22.....10%
Copper.....50%

Elbows, Stove Pipe—

Dover, one piece (R. M. Co.)....40&10%
Perfect Elbows.....40%

Emery, Turkish—

	¼ to ½:	5½ to 220:	Flour.
Kegs.....lb.	*5 ¢*	*5½¢*	*5½¢*
½ Kegs.....lb.	*5¼ ¢*	*5¾¢*	*5¾¢*
¼ Kegs.....lb.	*5½¢*	*6 ¢*	*4 ¢*
10-lb. cans, 10 in case....	*6½¢*	*7 ¢*	*6 ¢*
10-lb. cans, less than 10.....	*10 ¢*	*10 ¢*	*8 ¢*
Less quantity..	*10 ¢*	*10 ¢*	*8 ¢*

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice

Fasteners, Blind—See *Squeezers, Lemon.*

Zimmerman's ..... 50&10%
Walling's ..... 40&10%

Cord and Weight—

Ives 33⅓%

Faucets—

Cork Lined ..... 50@50&10%
Metallic Key, Leather Lined .. 60&10@70%
Red Cedar ..... 40&10@50%
Petroleum ..... 70&10@75%
B. & L. B. Co.:
Metal Key ..... 60&10%
Star 60%
West Lock ..... 50&10%
John Sommer's Peerless Tin Key 40%
John Sommer's Boss Tin Key 50%
John Sommer's Victor Mtl. Key ..... 50&10%
John Sommer's Duplex Metal Key 60%
John Sommer's Diamond Lock 40%
John Sommer's I. X. L. Cork Lined 50%
John Sommer's Reliable Cork Lined .. 50&10%
John Sommer's Chicago Cork Lined 60%
John Sommer's O. K. Cork Lined 50%
John Sommer's No Brand, Cedar 50%
John Sommer's Perfection, Cedar 40%
McKenna, Brass:
Burglar Proof, N. P. 25%
Improved, ¾ and ⅞ inch 25%
Self Measuring:
Enterprise, ℔ doz. $36.00 ..... 40&10%
Lane's, ℔ doz. $36.00 ..... 40&10%
National Measuring, ℔ doz. $36.40&10%

Felloe Plates—

See *Plates, Felloe.*

Files— Domestic—

List Nov. 1, 1899.
Best Brands ..... 70&10@75&10%
Standard Brands ..... 75&10@75&10&10%
Lower Grade ..... 75&10&10@80&10%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97 ..... 33 1-3@40%

Fixtures, Fire Door—

Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 ..... $3.75
Fusible Links, No. 96 ..... 50%
Expansion Bolts, No. 107 ..... 60&10%

Grindstone—

Net Prices:

Inch	*15*	*17*	*19*	*21*
Per doz	*$3.25*	*3.75*	*4.25*	*4.75*

P., S. & W. Co. ..... 30&10%
Reading Hardware Co. 60%
Stowell's Giant Grindstone Hanger .. ℔ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy, 40&10%; Light 50%

Fodder Squeezers—

See *Compressors.*

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Ezy Potato ..... 60&10%
Victor, Hay ..... 60&15&2½%
Victor, Manure 66⅔%
Victor, Header 65%
Champion, Hay 66⅔%
Champion, Header 65%
Champion, Manure ..... 60&15&2½%
Columbia, Hay ..... 60&20%
Columbia, Manure 70%
Columbia, Spading ..... 70&12½%
Hawkeye Wood Barley 40%
W. & C. Potato Digger ..... 60&10%
Acme Hay ..... 60&20%
Acme Manure, 4 tine ..... 60&10&5%
Dakota Header ..... 60&20%
Jackson Steel Barley ..... 60&20%
Kansas Header 65%
W. & C. Favorite Wood Barley 40%
Plated.—See Spoons.

Frames— Saw—

White, S'g't Bar, per doz. ..... 75@80¢
Red, S'g't Bar, per doz. ..... $1.00@1.25
Red, Dbl. Brace, per doz. ..... $1.40@1.50

Freezers, Ice Cream—

Qt.	*1*	*2*	*3*	*4*	*6*
Each	*$1.30*	*$1.60*	*$1.90*	*$2.20*	*$3.80*

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped 3.65
Waterproof Dbl. Taped 4.40
Waterproof Tpl. Taped 5.15

10&5%

Gates, Molasses and Oil—

Stebbins' Pattern ..... 80&10%

Gauges—

Marking, Mortise, &c. ..... 50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c. ..... 50&50&10%
Scholl's Patent ..... 50&10@50&10&10%
Door Hangers ..... 50@50&10%
Disston's Marking, Mortise, &c. 67½%
Stanley R. & L. Co.'s Butt and Rabbet Gauge 35%
Marking and Mortise 55%
Wire, Brown & Sharpe's 25%
Wire, Morse's 25%
Wire, P., S. & W. Co. 30%

Gimlets— Single Cut—

Numbered assortments, per gro.

Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.30; 2, $4.60

Glass, American Window

See *Trade Report.*

Glasses, Level—

Chapin-Stephens Co. ..... 60@60&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush .. 25&10@50%
International Glue Co. (Martin's) .. 40%

Grease, Axle—

Common Grade .... *gro.* $4.50@6.00
Dixon's Everlasting, 10-lb pails, ea. 85¢; in boxes, ℔ doz., 1 lb, $1.20; 2 lb. $2.00
Helmet Hard Oil 25%

Griddles, Soapstone—

Pike Mfg. Co. ..... 33⅓@33⅓&10%

Grindstones—

Bicycle Emery Grinder $6.50
Bicycle Grindstones, each ..... $2.50@3.00
Pike Mfg. Co.:
Improved Family Grindstones, ℔ inch, ℔ doz., $2.00 ..... 33⅓%
Royal Mfg. Co.:
Alundum Grinding Machines, each, Nos. 01, $1.75; 1A, $2.50; 10, $5.00 ..... 30%
Alundum Sickle Grinders, each, Nos. 20A, $6.00; 20A Combined, $6.50 ..... 30%
Alundum Disc Grinders, each, $2.50 ..... 30%

Grips, Nipple—

Perfect Nipple Grips ..... 40&10&2%

Halters and Ties—

Cow Ties ..... 60&10@60&10&5%
Covert Mfg. Co.:
Web 45%
Jute Rope 45%
Sisal Rope 33⅓%
Cotton Rope 45%
Hemp Rope 45%
Oneida Community:
Am. Coil and Halters ..... 40@40&5%
Am. Cow Ties ..... 45@60%
Niagara Coil and Halters ..... 45@60&5%
Niagara Cow Ties ..... 45&5@50&10&5%

Hammers—

Handled Hammers—

Heller's Machinists' ..... 40&10@40&10&10%
Heller's Farriers ..... 40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75 ..... 50%
Peck, Stow & Wilcox, Steel 50%
Fayette R. Plumb:
Plumb, A. E. Nail ..... 40&2½@40&12½%
Engineers' and B. S. Hand ..... 50&12½@60%
Machinists' Hammers ..... 50&15@60&5%
Riveting and Tinners' ..... 40&2½@40&12½%

Heavy Hammers and Sledges—

Under 3 lb., per lb., 50¢ ..... 80&10&5%
3 to 5 lb., per lb., 40¢ ..... 80&10&5%
Over 5 lb., per lb., 30¢ ..... 80&10&10&5%
Wilkinson's Smiths' ..... lb. 9½@10¢

Handles—

Agricultural Tool Handles

Axe, Pick, &c. .... 60&10@60&10&5%
Hoe, Rake, &c. ..... 45@50%
Fork, Shovel, Spade, &c.:
Long Handles ..... 45@50%
D Handles ..... 50@50&5%

Cross-Cut Saw Handles—

Atkins' 40%
Champion 50%
Disston's 50%

Mechanics' Tool Handles—

Auger, assorted ... *gro.* $2.50@3.00
Brad Awl ..... *gro.* $1.65@1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@$2.65; Hickory ..... $2.15@2.40
Socket Firming, Apple, $1.75@$1.95; Hickory ..... $1.45@1.60
Socket Framing, Hickory, $1.60@1.75
File, assorted ..... *gro.* $1.30@1.40
Hammer, Hatchet, &c. 60&10@60&10&5%
Hand Saw, Varnished, doz. 80¢@85¢; *Not Varnished* ... 65@75¢
Plane Handles:
Jack, doz. 30¢; Jack, Bolted .75¢
Fore, doz. 45¢; Fore, Bolted .90¢
Chapin-Stephens Co.:
Carving Tool ..... 40@40&10%
Chisel ..... 65@65&10%
File and Awl ..... 65@65&10%
Saw and Plane ..... 40@40&10%
Screw Driver ..... 40@40&10%
Millers Falls Adj. and Ratchet Auger Handles ..... 20&10%
Nicholson Simplicity File Handle ..... ℔ gro. $0.85@$1.50

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.

Allith Mfg. Co.:
Reliable, No. 1; Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door 50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle ..... 60&10%
Roller Bearing 70%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00 ..... 70%
Roller Bearing, No. 11, $15.00 ..... 70%
Roller Bearing, Ex. Hy., No. 22, $18.00 ..... 70%
Hinged Hangers, $16.00 ..... 60&10%
Lane Bros. Co.:
Parlor, Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard ..... 60&5%
Hinged ..... net $6.08
Covered ..... 60&2%
Special ..... 70&5%
Lawrence Bros.:
Advance and Sterling ..... 60&10%
Cleveland and Peerless 75%
Clipper, No. 75 ..... 60%
Crown ..... 60&10%
Easy Parlor Door, Dbl. Sets, $2.50; Single Sets, $1.25.
Giant ..... 60&5%
Hummer ..... 70&5%
New York ..... 60&10%
McKinney Mfg. Co.:
No. 1, Special, $15 ..... 60&10%
No. 2, Standard, $18 ..... 60&10%
Hinged Hangers, $16 ..... 50%
Meyers' Stayon Hangers ..... 60&5%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3 ..... $2.25
Roller B'r'g St'l Track No. 12 ..... $2.20
Roller B'r'g St'l Track No. 13 ..... $2.50
Roller B'r'g, Nos. 39, 41, 43, 70&7½%
Hero, Adj. Track No. 19 ..... 50&10%
Adjustable Track Tandem Trolley Track No. 16 ..... 50&10%
Seal, Steel Track No. 8 ..... $2.25
Auto Adj. Track No. 22 ..... 50&5%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.25; No. 121, $2.45; No. 150 ..... $2.50
Safety Unuerwriters F. D. No. 101 ..... 50%
Tandem No. 41, 2½ and 3 ..... 60&10%
Palace, Adjustable Track No. 132 ..... 50&5%
Royal, Adjustable Track No. 122 ..... 50&10%
Ives' Wood Track No. 1 ..... $2.25
Trolley B. D. No. 20 ..... 50&10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 29 ..... $1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2 ..... 70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3 ..... 60%
Hinged Tandem No. 48 ..... 60&5%
Folding Door B. B. Swivel No. 139 ..... 40%
Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing 30%
Ajax Hinge Door 60%
Apex Parlor Door ..... 50&10&5%
Atlas 60%
Baggage Car Door 50%
Climax Anti-Friction 50%
Elevator 40%
Express 50%
Lundy Parlor Door 50%
Matchless 60%
Nansen 70%
Parlor Door, 50&10%; Railroad, 50&10%
Steel, Nos. 300, 404, 500 ..... 50%
Underwriters' Fire Door 40%
Wild West Warehouse Door 50%
Wilbern, No. 0, net, ℔ doz. $9.00
Zenith for Wood Track 50%
A. L. Sweet Iron Works:
Check Back, 70%; Eagle 70%
Climax Anti-Friction ..... 50&10%
Hylo Hinge, New Perfection, Pilot, Pilot Hinge 60%
Rider Wooster 65%
Western Pattern 70%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing ..... 50&15&10&5%

Hangers— Garment—

Pullman Trouser, ℔ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.50; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro., $10.50; Garment Hanger Loops, Round Nickeled, per gro. $10.50
Victor Folding ..... ℔ gro. $9.60
Western, W. G. Co. ..... 75&10%

Gate—

Myers' Patent Gate Hangers, ℔ doz. net $4.50

Joist and Timber—

Lane Bros. Co. 30%

Hasps—

Griffin's Security Hasp 50%
McKinney's Perfect Hasp, ℔ doz. .. 50%

Hatchets—

Regular list, first quality 50%
Second quality $1.00 per doz. less than first quality.

Heaters, Carriage—

Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 9E, $3.25; No. 1, $3.50 ..... 15%
Clark Coal, ℔ doz. $0.75 ..... 10%

Extra 5&10% often given.

Hinges—

Blind and Shutter Hinges—

Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*3*	*5*
Doz. pair	*$0.75*	*1.35*	*2.70*

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	*$0.70*	*.65*	*.60*

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50 ..... 10%
Charles Parker Co. ..... 70@75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00 ..... 20%
Reading's Gravity 60%
Stanley's Steel Gravity Blind Hinges, No. 1647½, ℔ doz. sets, without screws, $0.35; with screws, $1.25.
Wrightsville Hardware Co.:
O. S., Lull & Porter ..... 75&10&5
Acme, Lull & Porter ..... 75&10%
Queen City Reversible ..... 75&10%
Shepard's Noiseless, Nos. 60, 65, 55 ..... 75&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75&10&5%
1868, Old Pat'n, Nos. 1, 3 & 5 ..... 75&10&5%
Tip Pat'n, Nos. 1, 3 & 5 ..... 75&10&5%
Buffalo Gravity Lockir , Nos. 1, 3 & 5 ..... 75&10&5%
Shepard's Double Locking, Nos. 20 & 25 ..... 70%
Champion Gravity Locking, No. 75 ..... 75%
Steamboat Gravity Locking, No. 10 ..... 75%
Pioneer, Nos. 060, 45 & 5½ 75%
Empire, Nos. 101 & 103 ..... 70%
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L'tchs.	*$2.00*	*2.70*	*5.00*
Hinges only	*1.40*	*2.05*	*3.80*
Latches only	*.70*	*.70*	*.35*

New England:
With Latch ..... *doz.* ..... *@$2.00*
Without Latch ..... *doz.* ..... *@$1.60*
Reversible Self-Closing:
With Latch ..... *doz.* ..... *@$1.75*
Without Latch ..... *doz.* ..... *@$1.35*
Western:
With Latch ..... *doz. $1.75*
Without Latch ..... *doz. $1.15*
Wrightsville Hardware Co.:
Shepard's or Clark's, doz. sets, Nos. 1, 2, 3
Hinges with Latches $2.00 2.70 5.00
Hinges only 1.40 2.05 3.80
Latches only ..... .70 .70 1.35

Pivot Hinges

Bommer Bros. Pivot 40%
Lawson Mfg. Co. Matchless 45%

Spring Hinges—

Holdback, Cast Iron ... *$6.50@$7.00*
Non-Holdback, Cast Iron *$6.25@$6.75*
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges 45%
Bardsley's Patent Checking 15%
Bommer Bros.:
Bommer Ball Bearing Floor 40%
Bommer Spring Hinges 40%
No. 999 Wrot. Steel Hold Back, ℔ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges 25%
Triple End Spring Hinges 50%
Chicago (Ball Bearing) Floor 50%
Garden City Engine House 25%
Keene's Saloon Door 25%
Columbian Hardware Co.:
Acme, Wrought Steel 30%
Acme, Brass 25%
American 30%
Columbia, ℔ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ℔ gr. $12.00
Gem, new list 30%
Clover Leaf ..... ℔ gr. $12.00
Oxford, new list 30%
Floor Spring Hinges ..... 65&10%
Lawson Mfg. Co., Matchless 30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door ..... ℔ gr. $9.00
Chief Ball Bearing Floor Hinge 50%
Ball Bearing Door 25%
No. 777, Sheet Steel Holdb'k, ℔ gr. pr. $9.00
Superior Spring Hinge Co.:
Superior Floor Hinges 33⅓%
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ℔ gr. $12.50
Ideal, No. 4 ..... ℔ gr. $9.00
New Idea No. 1 ..... ℔ gr. $9.00
New Idea, Double Acting 50%
New Idea Floor 50%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:

Light Strap Hinges ... 65%
Heavy Strap Hinges ... 75%
Light T Hinges 60%
Heavy T Hinges 55%
Extra H'y T Hinges ... 70%
Hinge Hasps 45%
Cor. Heavy Strap ... 75%
Cor. Ex. Heavy T ... 70&10%

Screw Hook and Strap. { *6 to 12 in.* .. *lb.* 3¼¢ ; *1½ to 20 in.* .. *lb.* 3¼¢ ; *22 to 36 in.* .. *lb.* 3¼¢ }

Extra, 1048@10&10%

Screw Hook and Eye:
¾ to 1 inch ..... *lb. 6½¢*
⅝-inch ..... *lb. 7½¢*
½-inch ..... *lb. 8½¢*

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—
	Per doz.			
Inch	*15*	*16*	*17*	*18*
Galv. Open	*$2.50*	*2.75*	*3.00*	*3.25*
Jap. Open	*$1.90*	*2.10*	*2.25*	*2.55*
Galv. Funnel	*$3.00*	*3.30*	*3.60*	*3.90*
Jap. Funnel	*$2.45*	*2.65*	*2.85*	*3.30*

Masons' Etc.—
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $0.95
Steel Mortar, No. 158.....each $1.25

Hoes— Eye—
Scovil and Oval Pattern.....
60&10@60&10&10%
Grub, list Feb. 23, 1899.....
70&10@75&10%
D. & H. Scovil.....30%

Handled—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding No. 1, $2.00; No. 2, $2.28
Ft. Madison Cotton Hoe....70&10&10%
Ft. Madison Crescent Cultivator Hoe, ℔ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....℔ doz. 66⅔%
Junior Size.....℔ doz. $4.00
Ft. Madison Sprouting Hoe..℔ doz. 50%
Ft. Madison Dixie Tobacco Hoe.....
75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
B. B., 6 in., Cultivator Hoe.....$3.15
B. B., 6½ in.....$3.35
Acme Weeding.....℔ doz., net, $4.35
W. & C. L'tning Shuffle Hoe, ℔doz.$4.85

Hoisting Apparatus—
See *Machines, Hoisting.*

Holders— Bit—
Angular, ℔ doz. $24.00.....45&10%

Door—
Bardsley's 45%
Empire 50%
Pullman 35%
Superior 33⅓%

File and Tool—
Nicholson File Holders and File Handles .....33⅓@40%

Fruit Jar—
Triumph Fruit Jar Holder, ℔ gross, $10.80; ℔ doz.....$1.25

Trace and Rein—
Fernald Double Trace Holder, ℔ doz. pairs $1.25
Dash Rein Holder, ℔ doz pairs..$1.25

Hones—Razor—
Pike Mfg. Co., Belgian, German and Swaty 50%

Hooks—Cast Iron—
Bird Cage, Reading.....40%
Clothes Line, Reading List.....40%
Clothes Line, Stowell's.....70%
Coat and Hat, Reading.....45&20%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....65%
Harness, Reading List.....40%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—
Belt .....*80&10@..%*
Wire C. & H. Hooks:.....
75&10@75&10&10%
Columbian Hdw Co., Gem.....70&10%
Parker Wire Goods Co., King..70&10%
Western W. G. Co. Molding.....75%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—
Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton .....*doz. $1.05@$1.25*
Wrought Staples, Hooks, &c.—
See Wrought Goods

Miscellaneous—
Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz. $4.75; Medium, $5.35; Heavy, $6.25.
Grass, best, all sizes, per doz.$1.60
Grass, common grades, all sizes, per doz. *$1.30*
Whiffletree .....*lb. 5¾@6¢*
Hooks and Eyes:
Brass .....*60&5@60&10&5%*
Malleable Iron.....*70@70&10%*
Covert Mfg. Co. Gate and Scuttle Hooks 40%
Ft. Madison Cut-Easy Corn Hooks, ℔ doz. $3.25 net.
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—
See *Nails, Horse.*

Horseshoes—
See *Shoes, Horses.*

Hose, Rubber—
Garden Hose, ¾-inch:
Competition .....*ft. 5 @ 6 ¢*
3-ply Guaranteed..ft. 8 @ 9 ¢
4-ply Guaranteed..ft. 10 @11 ¢
Cotton Garden, ¾-in., coupled:
Low Grade.....*ft. 8 @ 9 ¢*
Fair Quality.....*ft. 10 @11 ¢*

Irons— Sad—
From 1 to 10.....*lb. 3 @3¼¢*
B. B. Sad Irons.....*lb. 3¼@3½¢*
Mrs. Potts', cents per set:
	Nos. 50	55	60	65
Jap'd Tops	*65*	*62*	*75*	*72*
Tin'd Tops	*70*	*67*	*80*	*77*

New England Pressing..lb. 3¾@4¢

Pinking—
Pinking Irons.....*doz. 60¢*

Irons, Soldering
See *Coppers.*

Jacks, Wagon—
Covert Mfg. Co.:
Auto Screw.....30&2%; Steel, 45%
Lockport 50%
Lane's Steel.....30&10&2%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....25%

Kettles—
Brass, Spun, Plain.....*20@25%*
Enameled and Cast Iron—See Ware, Hollow.

Knives—
Butcher, Kitchen, &c.—
Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....60%

Corn—
Wilkinson Shear & Cutlery Co., Wilcut Brand Knives and Hooks.60%
Withington Acme, ℔ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—
Standard List.....*75&5@75&10%*
C. E. Jennings & Co., Nos. 45, 46..60%
Jennings & Griffin, Nos. 41, 42.....60%
Swan's 75%
Watrous 16⅔%
L. & I. J. White.....20&5&2%

Hay and Straw—
Serrated Edge, per doz..$5.75@6.00
Iwan's Sickle Edge.....℔ doz. $9.50
Iwan's Serrated.....℔ doz. $10.00

Mincing—
Buffalo .....℔ gro. $13.00

Miscellaneous—
Farriers' .....*doz. $3.00@3.25*
Wostenholm's .....℔ doz. $3.00@3.25

Knobs—
Base, 2½-inch, Birch, or Maple, Rubber Tip.....*gro. $1.25@$1.40*
Carriage, Jap., all sizes.....
gro. 40@45¢
Door, Mineral.....*doz. 65@70¢*
Door, Por. Jap'd.....*doz. 70@75¢*
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c.15%

Lacing, Leather—
See *Belting, Leather—*

Ladders, Store, &c.—
Allith Mfg. Co., Reliable.....50%
Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—
L. & G. Mfg. Co. (low list).....25%
P. S. & W.....40&10%
Reading 60%

Lanterns—Tubular—
Regular Tubular, No. 0.....
doz. $4.25@4.50
Lift Tubular, No. 0.....
doz. $4.75@5.00
Hinge Tubular, No. 0.....
doz. $4.75@5.00
Other Styles.....*40@40&5%*

Bull's Eye Police—
No. 1, 2¾-inch.....*$2.75@3.00*
No. 2, 3-inch.....*$3.00@3.25*

Lasts and Stands, Shoe—
Stowell's Atlas, Malleable Iron.....50%
Stowell's Badger, Cast Iron.....50%

Latches— Thumb—
Roggin's Latches, with screw..
doz. 35@40¢

Door—
Allith Mfg. Co., Automatic, No. 400, ℔ doz.....$4.00
Cronk & Carrier Mfg. Co., No. 101, ℔ doz. $2.30
Cronk & Carrier Mfg. Co., Latch, Hasp and Staples.....50%
Richards' Bull Dog, Heavy, No. 125 .....50&5%
Richards' Trump, No. 127.....$1.50
Stowell's Steel.....50%

Leaders, Cattle—
Small.....*doz. 50¢; large, 60¢*
Covert Mfg. Co.:
Cotton, Hemp and Jute, 45%; Sisal, 33⅓%.

Lifters, Transom—
R. & E.....33⅓%

Lines—
	Wire Clothes, Nos.	18	19	20
100 feet		*$2.25*	*2.00*	*1.75*
75 feet		*$1.75*	*1.35*	*1.10*

Anniston Waterproof Clothes, 50 ft., ℔ gro., $25.00; Gilt Edge, $23.00; Air Line, $23.00; Acme, $18.00; Alabama, $17.00; Empire, $16.00; Advance, $14.00; Eclipse, $13.50; Chicago, $11.50; Standard, $10.50; Columbia, $9.50; Allston, $13.50; Calhoun, $12.00.
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'.....30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....℔ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50 .....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%

Locks— Cabinet—
Cabinet Locks...*33⅓@33⅓&7½%*

Door Locks, Latches, &c.—
NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....40%

Elevator—
Stowell's 50%

Padlocks—
Wrought Iron....*75&10&5@80&5%*
Net prices are general.
R. & E. Mfg. Co. Wrought Steel and Brass .....75&10%

Sash, &c.—
Ives' Patent:
Bronze and Brass, 60%; Crescent, 40&20%; Iron, 60%; Window Ventilating, 55%; Robinson Pat. Ventilating Sash Lock, 33⅓%; Wrought Bronze and Brass, 55%; Wrought Steel, 55%.
Pullman Patent Ventilating Lock..35%
Reading 40%

Machines—Boring—
Com. Upr't, without Augers,
$2.00@2.25
Com. Angl'r, without Augers,
$2.25@2.50
Swan's Improved.....40&10%
Jennings', Nos. 1 and 4.....35&5%
Millers Falls.....5.75
Snell's Rice's Patent.....$2.50@2.75

Corking—
Reisinger Invincible Hand Power.... ℔ doz. $48.00

Fence—
Williams' Fence Machines....each, $5.50

Hoisting—
Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake 20%

Ice Cutting—
Chandler's 12½%

Washing—
Boss Washing Machine Co.: Per doz.
Boss No. 1.....$57.00
Boss Rotary.....54.00
Champion Rotary Banner No. 1..$54.00
Standard Champion No. 1.....$48.00
Standard Perfection.....$26.00
Cinti Square Western.....$30.00
Uneeda American, Round.....$30.00

Mallets—
Hickory .....*45&5@50%*
Lignumvitæ .....*45&5@50%*
Tinners' Hickory and Applewood .....*doz. 45&5@50%*

Mangers, Stable—
Swett Iron Works.....50%

Mashers, Vegetable—
Western, W. G. Co., Potato....60&10%

Mats, Door—
Elastic Steel (W. G. Co.), new list.50%
Keystone Wire Matting Co.:
Keystone 50%
Ideal 50%

Mattocks—
See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—
Enterprise Mfg. Co.....20@25%
National list Jan. 1, 1902.....30%
Parker's Columbia & Victoria.50&10@60%
Parker's Box and Side.....50&10@60%
Swift, Lane Bros. Co.....30%

Motors Water—
Divine's Red Devil.....30%

Mowers, Lawn—
NOTE.—Net prices are generally quoted
Cheapest.....*all sizes, $1.85@2.00*
Cheap .....*all sizes, $2.00@2.50*
Better Grade..*all sizes, $2.50@4.50*
	12	14	16	18-in.
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*

Continental .....60&5%
Great American.....70%
Great American Ball B'r'g, new list.70%
Quaker City.....70%
Pennsylvania .....60&5%
Pennsylvania, Jr., Ball Bearing....60%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Granite State:
Style A, Low Wheel....70&10&10&5%
Style B, Low Wheel.....70&10&5%
Style C, High Wheel.....70&10%
Style D, High Wheel.....70%
Philadelphia:
Styles M., S., C., K., T.....70&5%
Style A, all Steel.....60&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list.50%

Nails—
Wire Nails and Brads, Miscellaneous .....*85&10@85&10&5%*
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—
Nos.	6	7	8	9	10	
Anchor	23	21	20	19	18	...40&5%
Champlain	28	26	25	24	23	.....50%
Coleman	13	12	12	11	11	.....net
New Haven	23	21	20	19	18	...40&5%
Livingston	19	18	17	16	16	.....10%
Western						℔ lb 8½¢

Jobbers' Special Brands.....
per lb. 9@10¢

Picture—
	1½	2	2½	3	in.
Brass H'd.	*.45*	*.55*	*.60*	*.70*	*.. gro*
Por. Head.	*1.10*	*1.10*	*1.10*		*.. gro*

Nippers—
See *Pliers and Nippers.*

Nuts—
Cold Punched: *Off list.*
Square, Blank or Tapped..
4.80@4.90¢
Hexagon, Blank or Tapped..
5.20@5.30¢
Square, Blank, C. & T.5.10@5.20¢
Hexagon, Blank, C. & T...
5.80@5.90¢
Hot Pressed:
Square, Blank.....*5.00@5.10¢*
Hexagon, Blank.....*5.40@5.50¢*
Square, Tapped.....*4.90@5.00¢*
Hexagon, Tapped....*5.30@5.40¢*

Oakum—
Best .....*lb., 6½¢*
U. S. Navy.....*lb., 6¢*
Navy .....*lb., 5¢*
Plumbers' Spun Oakum.....*3¾¢*
In carload lots ⅛¢ lb. off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—
Brass and Copper.....*50&10%*
Tin or Steel.....*65&10&5@70%*
Zinc .....*65&10&5@70%*
Chase or Paragon:
Brass and Copper.....*50&10%*
Tin or Steel.....*65&10%*
Zinc .....*65&10%*
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers— Can— *Per doz.*
Sprague, Iron Handle....*30@35¢*
Sprague, Wood Handle...*35@40¢*
Sardine Scissors.....*$1.75@$3.00*
National .....50&10%
Vim Tin Shear and Can Opener, ℔ doz., 75c.; per gro., $7.50

Egg—
Nickel Plate, ℔ doz., $2.00; Silver Plate, $4.00.

Packing—
Asbestos Packing, Wick and Rope .....*17@22¢*

Rubber—
(*Fair quality goods.*)
Sheet, C. I.....*11@12¢*
Sheet, C. O. S.....*11@12¢*
Sheet, C. B. S.....*12@13¢*
Sheet, Pure Gum.....*40@45¢*
Sheet, Red.....*40@50¢*
Jenkins' '96, ℔ lb 80¢.....25@25&5%

Miscellaneous—
American Packing...*lb. 7@10 ¢*
Cotton Packing.....*lb. 16@25 ¢*
Italian Packing.....*lb. 9@12½¢*
Jute .....*lb. 4@ 4½¢*
Russia Packing.....*lb. 8@11 ¢*

Pails, Creamery—
R. M. Co., with gauges, ℔ doz., No. 1, $6.25; No. 2, $6.50.

Pails, Water, Well, &c.—
See *Buckets.*

Pans— Dripping—
Standard List.....*65&10%*

Fry—
Common Lipped:
Nos.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—
Inch	*12*	*14*	*16*	*18*
Per doz.	*$1.75*	*2.25*	*2.80*	*3.15*

Roasting and Baking—
Regal, R. M. Co., ℔ doz., Nos. 5, $4.50; 10, $5.25; 20, $5.75; 30, $6.25.
Savory, ℔ doz., net, Nos. 200, $9.00; 400, $15.00.
Simplex, ℔ gro.:
No.	40	50	60	140	150	160
	$30.00	35.00	42.00	34.00	39.00	46.00

Paper—Building Paper
Asbestos: *lb.*
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft.3½@5¢
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lb., per 100 sq. ft.....*6¢*
Mill Board, Sheet, 40 x 40 in., 1-32 to ½ in.....*3@15¢*
Per roll
Rosin Sized Sheathing: 500 sq. ft.
Light weight, 25 lbs. to roll
40@50¢
Medium weight, 30 lbs. to roll.
50@55¢
Heavy weight, 40 lbs. to roll..
65@70¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....*$50.00*
Red Rope Roofing, 250 sq. ft. per roll.....*$1.75*

Tarred Paper—
1 ply (roll 400 sq. ft.), ton....
$31.00@$35.00
2 ply, roll 108 sq. ft.....*57¢*
3 ply, roll 108 sq. ft.....*87¢*
Slater's Felt (roll 500 sq. ft.).76¢

Sand and Emery—
Flint Paper and Cloth.50&10@—%
Garnet Paper and Cloth....*25%*
Emery Paper and Cl'th..50&10@60%

Parers— Apple—
Advance .....℔ doz. $4.20
Baldwin .....℔ doz. $4.00
Bonanza Improved.....each $6.50
Daisy .....℔ doz. $4.00
Dandy .....each $7.50
Eureka Improved.....each $20.00
Family Bay State.....℔ doz. $15.00
Improved Bay State.....℔ doz. $36.00
Little Star.....℔ doz. $5.00
New Lightning.....℔ doz. $7.00
Reading 72.....℔ doz. $3.25

steading 78.....₩ doz. $6.25
Rocking Table.....₩ doz. 36.20
Turn Table '98.....₩ doz. $6.00
White Mountain.....₩ doz. $5.00

Potato—

Saratoga .....₩ doz. $7.00
White Mountain.....₩ doz. $6.00

Picks and Mattocks—

List, Feb. 23, 1899.....75@75&5%
Cronk's Handled Garden Mattock, ₩ doz., $6.40.....33⅓%

Pinking Irons—

See *Irons, Pinking.*

Pins, Escutcheon—

Brass .....50&10@60%
Iron, list Nov. 11, '85..60@60&10%

Pipe, Cast Iron Soil—

Carload lots.
*Standard, 2-6 in.*50&10@50&10&5%
Extra Heavy, 2-6 in.....65&10%
Fittings .....70&10@70&10&5%

Pipe, Merchant—

	Consumers, Steel. Blk.	Galv.	Carloads. Iron. Blk.	Galv.
⅛ & ¼ in.	71%	55%	68%	52 %
⅜ in.	73½	59%	70½	56 %
½ in.	75%	63½	72½	60 %
¾ to 6 in.	79%	69%	76½%	66½%
7 to 12 in.	74%	59%	71½%	56 %

Pipe, Vitrified Sewer—

Carload lots.
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:
First-class .....85@86%
Second-class 90%
NOTE.—Market irregular.

Pipe, Stove—

Edwards' Nested:	C. L.	L. C. L.
5 in., per 100 joints	$7.00	$8.00
6 in., per 100 joints	7.50	8.50
7 in., per 100 joints	8.50	9.50

Planes and Plane Irons—

Wood Planes—

Bench, first qual.....35@35&10%
Bench, second qual...45@45&10%
Molding .....30@30&10%
Bailey's (Stanley R. & L. Co.) .35&2½%
Chapin-Stephens Co.:
Bench, First Quality.....35%
Bench, Second Quality.....45%
Molding and Miscellaneous.....30%
Toy and German.....35%
Union 60%

Iron Planes—

Bailey's (Stanley R. & L. Co.)....35%
Chapin's Iron Planes.....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....30&5%
Union 60%

Plane Irons—

Wood Bench Plane Irons.....25@25&10%
Buck Bros.....30%
Chapin-Stephens Co.....25%
Stanley R. & L. Co.....35%
Union 50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—

Kohler's Eclipse.....₩ doz. $8.00

Plates—

Felloe .....*lb.* 4@4¼¢
Self-Sealing Pie Plates (R. M. Co.), ₩ doz. $2.00.....50%

Pliers and Nippers—

Button Pliers....75&10@75, 10, 5%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.

Gas Pipe..	7	8	10	12-in.
	$2.00	$2.25	$2.75	$3.50

Acme Nippers.....50&5%
Cronk & Carrier Mfg. Co.:
American Button.....75&10%
Cronk's 60%
Stub's Pattern.....50%
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers and Tools.....40&10@40&10&10%
The Nettleton Mfg. Co. Reversible Cutting Nippers.....40%
P., S. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard, 33⅓%; Elm City, 33⅓%; Paragon, 50%; Lodi, 50%.
Swedish Side, End and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10&5%
Chapin's Imp. Brass Cor..40@40&10%
Pocket Levels.....30@30&10&5%
Extension Sights.....30@30&10&5%
Machinists' Levels.....40@40&10%
Disston's Plumbs and Levels.....67½%
Disston's Pocket Levels.....67½%
C. E. Jennings & Co.'s Iron.....33⅓%
C. E. Jennings & Co.'s Iron, Adjustable .....40&7½%
Stanley R. & L. Co.....40%
Stanley's Duplex.....33%
Woods' Extension.....33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₩ doz., No. 1, $6.00; No. 2, $9.00; No. 3, $9.00; No. 4, $12.00.....50%

Points, Glaziers'—

Bulk and 1-lb. papers,.....*lb.* 10¢
½-lb. papers.....*lb.* 9@10½¢
¼-lb. papers.....*lb.* 9¾@11¢

Pokes, Animal—

Ft. Madison Hawkeye.....₩ doz. $3.25
Ft. Madison Western.....₩ doz. $4.00

Police Goods—

Manufacturers' Lists...25@25&5%
Tower's 25%

Polish—Metal, Etc—

Glasbrite, No. 2, 5 lb can (powder), each, $1.25; ₩ doz., $12.00; No. 2, 10 lb can (cake), each, $2.50; ₩ doz., $24.00.
Prestoline Liquid, No. 1 (½ pt.), ₩ doz., $3.00; No. 2 (1 qu.), $9.00..40%
Prestoline Paste.....40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₩ doz. 50¢; ₩ gro. $4.50; ½ lb boxes, ₩ doz. $1.25; 1 lb boxes, ₩ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₩ doz., $1.25; ₩ gro., $12.00.
Barkeepers' Friend Metal Polish, ₩ doz., $1.75; ₩ gro., $18.00.
Wynn's White Silk, ½ pt. cans, ₩ doz. $2.00

Stove—

Black Eagle Benzine Paste, 5 lb cans, ₩ lb 10¢
Black Eagle, Liquid, ½ pt. cans.. ₩ doz. 75¢
Black Jack Paste, ¾ lb cans, ₩ gr. $9.00
Black Kid Paste, 5 lb can....each, $0.65
Ladd's Black Beauty Liquid, per 100 tins.....$6.75
Joseph Dixon's, ₩ gr. $5.75.....10%
Dixon's Plumbago.....₩ lb 8¢
Fireside .....₩ gr. $2.50
Gem, ₩ gr. $4.50.....10%
Japanese .....₩ gr. $3.50
Jet Black.....₩ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ₩ doz. $1.50
Wynn's:
Black Silk, 5 lb pail.....each 70¢
Black Silk, ½ lb box.....₩ doz. $1.00
Black Silk, 5 oz. box.....₩ doz. $0.75
Black Silk, ½ pt. liq.....₩ doz. $1.00

Poppers, Corn—

1 qt., Square.....*gro. $8.00*
1 qt., Round.....*gro. $9.00*
1½ qt., Square.....*gro.$10.00*
2 qt., Square.....*gro.$12.00*

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—

See *Parers, Potato.*

Pots, Glue—

Enameled 40%
Tinned 35%

Powder—

In Canisters:
Duck, 1 lb.....*each* 45¢
Fine Sporting, 1 lb....*each* 75¢
Rifle, ½-lb.....*each* 15¢
Rifle, 1-lb.....*each* 25¢
In Kegs:
12½-lb. kegs.....$3.50
25-lb. kegs.....$4.50
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.50
King's Smokeless: Shot Gun. Rifle.
Keg (25 lb bulk).....$12.00 $15.00
Half Keg (12½ lb bulk)... 6.25 7.75
Quarter Keg (6¼ lb bulk). 3.25 4.00
Case 24 (1 lb cans bulk).. 14.00 17.00
Half case 12 (1 lb c. bk)... 7.25 8.75
Robin Hood Sm'less Shot Gun..50&20%

Presses—

Fruit and Jelly—

Enterprise Mfg. Co.....20@25%

Seal Presses—

Morrill's No. 1, ₩ doz., $20.00.....50%

Pruning Hooks and Shears

See *Shears.*

Pullers, Nail—

Cyclops 50%
Miller's Falls, No. 3, ₩ doz., $12.00.....33⅓&10%
Morrill's No. 1, Nail Puller, ₩ doz. $20.00 .....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
Scranton, Case Lots:
No. 2B (large).....$5.50
No. 3B (small).....$5.00
Smith & Hemenway Co.:
Diamond B, case lots, ₩ doz., Large, $9.00; Small, $7.50.
Giant No. 1, ₩ doz., $18; No. 1½, $16.50; No. 3, $15.....33⅓%
Staple Pullers, Utica and Davison 60%
Parrot Tack and Stub Puller, ₩ doz., 75c.; ₩ gro., $6.00

Pulleys, Single Wheel—

Inch	*1½*	*1¾*	*2*	*3*
Awning or Tackle, doz.	*$0.30*	*.45*	*.60*	*1.05*
Hay Fork, Swivel or Solid Eye. doz., ¼ in., $1.25; 5 in., $1.55				
Inch	*2*	*2¼*	*2½*	
Hot House, doz.	*$0.65*	*.85*	*1.20*	
Inch	*1¼*	*1½*	*1¾*	*2*
Screw, doz.	*$0.16*	*.19*	*.23*	*.30*
Inch	*1¾*	*2*	*2¼*	*2½*
Side, doz.	*$0.25*	*.40*	*.55*	*.60*
Inch	*1½*	*1¾*	*2*	*2½*

Stowell's:
Ceiling or End, Anti-Friction..60&10%
Dumb Waiter, Anti-Friction..60&10%
Electric Light.....60%
Side, Anti-Friction.....60&10%

Sash Pulleys—

Common Frame; Square or Round End, per doz, 1¾ and 2 in.....*16@19¢*
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in....*17@19¢*
Acme.....1¾ in., 16¢; 2 in., 19¢
Fox-All-Steel, Nos. 3 and 7, 2 in.... ₩ doz. 50%
Grand Rapids All Steel Noiseless..50%
Ideal .....70&5%
Niagara.....1¾ in., 16¢; 2 in., 19¢
No. 26, Troy..1¾ in., 14½¢; 2 in., 16½¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See Blocks.

Pumps—

Cistern .....60@60&10%
Pitcher Spout.....80@80&10%
Wood Pumps, Tubing, &c..45@50%
Barnes Dbl. Acting (low list).....50%
Barnes' Pitcher Spout.....75&10&5%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co.....$16.00
Daisy Spray Pump.....₩ doz. $6.50
Flint & Walling's, Fast Mail Hand, (low list).....55%
Flint & Walling's, Fast Mail (low list) .....55&5%
Flint & Walling's Tight Top Pitcher.80%
National Specialty Mfg. Co., Measuring, Nos. 2, $6.00; 3, $5.50.....30%
Myers' Pumps (low list).....50%
Myers' Power Pumps.....50%
Myers' Spray Pumps.....50%

Pump Leathers—

Plunger and Lower Valve—Per gro.:

Inch...	*2*	*2¼*	*2½*	*2¾*
	$2.20	*2.50*	*2.75*	*3.00*
Inch...	*3*	*3¼*	*3½*	*3¾*
	$3.30	*3.60*	*3.85*	*4.10*

4
4.40

Plunger Cup Leathers—Per 100:

Inch...	*2½*	*3*	*3½*	*4*
	$2.75	*3.85*	*5.00*	*6.00*

Punches—

Saddlers' or Drive, good..... *doz. 50@75¢*
Spring, single tube, good quality .....*$1.75@2.00*
Revolving (4 tubes)..... *doz. $3.50@3.75*
Bemis & Call Co.'s Cast St'l Drive.50%
Bemis & Call Co.'s Check.....55%
Morrill's Nos. 1AA, 1A, 1B, 1C, $15.00 .....50%
Hercules, 1 die, each $5.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Wm. Schollhorn Co.:
Belt and Ticket, Bernard, 33⅓%; Paragon, 50%; Lodi.....50%
Steel Screw. B. & K. Mfg. Co.....50%
Tinners' Hollow, P., S. & W. Co.33⅓%
Tinners' Solid, P., S. & W. Co., ₩ doz., $1.44.....50%

Rail—Barn Door, &c.—

Sliding Door, Painted Iron.... *2½@2¾¢*
Sliding Door, Wrought Brass, 1⅛ in., lb., 36¢ *30%*
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail..₩ ft. 2¾ c
O. N. T. Rail.....2½¢
Griffin's:
xxx, ₩ 100 ft., 1 x 3-16 in., $3.00; 1¼ x 3-16 in., 3.50.
Hinged Hanger, ₩ 100 ft., 1 x 3-16 in., $3.10; 1¼ x 3-16 in., $3.60.
Lane's:
Hinged Track, ₩ 100 ft., 1 in., $3.40; 1¼ in., $3.96.
O. N. T., ₩ 100 ft., 1 in., $3.00; 1¼ in., $3.60; 1½ in., $4.00.
Standard, 1¼ in.....₩ 100 ft. $4.00
Lawrence Bros.:
₩ 100 ft. No. 201, $4.00; No. 202, $4.00
New York, 1 x 3-16 in., ₩ 100 ft. $2.75
McKinney's:
Hinged Hanger Rail, ₩ ft., 11¢..50%
None Better.....₩ ft. 3¾¢
Standard .....₩ ft. 4 ¢
Myers' Stayon Track.....60&10%
Richards' Mfg. Co.:
Common, 1 x 3-6 in., $3.00; 1⅛ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65.....50%
Gauge Trolley Track, ₩ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
No. 50.....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.
Stowell's:
Cast Rail.....₩ ft. 2¼ ¢
Steel Rail, Plain.....25%
Wrought Bracket, 1 3-16 in....₩ ft. 3¢
Wrought Bracket, 1⅛ x 5-16..₩ ft. 1¢
Swett's Hylo, ₩ ft. 11¢.....60%
P. L. B. Steel Rail.....₩ 100 ft. $3.00
No. 0, 1 x 3-16.....₩ 100 ft. $3.00

Rakes—

NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Jackson Lawn, 29 and 30 teeth, ₩ doz., net.....$4.25
Cronk's:
New Champion Garden, ₩ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00..75%
Victor Garden, ₩ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00.....60%
Queen City Lawn, ₩ doz., 20 teeth, $3.45; 24, $3.60.....net.
Anticlog Lawn, ₩ doz.....$4.00
Malleable Garden.....70&10%
Kohler's:
Lawn Queen, 20-tooth....₩ doz. $2.90
Lawn Queen, 24-tooth....₩ doz. $3.00
Paragon, 20-tooth.....₩ doz. $2.70
Paragon, 24-tooth.....₩ doz. $2.75
Steel Garden, 14-tooth....₩ doz. $2.40
Malleable Garden, 14-tooth, ₩ doz. $1.75@2.00

Rasps, Horse—

Disston's 75%
Heller Bros.'.....70&5@70&10&5%
McCaffrey's American St'd...60&10&5%
New Nicholson.....70&10@75%
See also Files.

Razors—

Liana Bo-ras-ic.....60%
Fox Razors, ₩ doz., No. 42, $20.00; No. 44, $20.00; No. 82, Platina, $25.00. } Dis 40%
Red Devil.....50%
Silberstein:
Carbo Magnetic, $21.00; Griffon, No. 65, $13.50; Griffon, No. 00, $12.00; all other Razors, 40%.

Safety Razors—

Kampfe Bros.:
Star Safety, 25%; Star Interchangeable, 25%; Star Safety Corn, 25%.
Silberstein 40%

Reels, Fishing—

Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo.....20%
Aluminum, German Silv., Bronze.25%
1240 N, 124 N.....20%
3004 N, 06 N, 6 RM, G 9.....25%
4 N, 6 PN, 24 N, 26 PN.....20%
2901 P., 33⅓%; 2904 PN., 33⅓%; 0924 N., 33⅓%; 02084 N., 33⅓%; 002904 PN., 33⅓%; 802 N., 33⅓%.....25%
986 PN, 2901 N, 974 PN.....20%
5009 PN, 5009 N.....20%
Competitor, 102 P., 102 PN, 202 P., 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—*List July 1, 1903.*

Japanned, Electroplated and Bronzed 70%
White Porcelain Enamel.....60%
Solid Brass or Bronze Metal, *40&10%*

Revolvers—

Single Action.....95¢@$1.00
Double Action, except 44 cal.$1.85
Double Action, 44 caliber....$2.00
Automatic $3.25
Hammerless $3.75

Riddles, Hardware Grade

16 in.....*per doz.$2.50@$2.75*
17 in.....*per doz.$2.75@$3.00*
18 in.....*per doz.$3.00@$3.25*

Rings and Ringers—

Bull Rings—

	2	2½	3 inch.
Steel	*$0.70*	*0.75*	*0.80 doz.*
Copper	*$1.00*	*1.15*	*1.40 doz.*

Rea's Improved Self-Piercing, ₩ doz., Copper, 2 in., $1.25; 2½ in., $1.50; 3 in., $1.75.

Hog Rings and Ringers—

Hill's Rings, gro. boxes.$4.00@$4.50
Hill's Ringers, Gray Iron..... *doz. 50@55¢*
Hill's Ringers, Malleable Iron.. *doz. 70@75¢*
Blair's Rings...*per gro.$4.75@5.25*
Blair's Ringers.per doz. $0.60@ .65
Brown's Rings..per gro.$5.00@5.50
Brown's Ringers.per doz.$0.60@ .65

Rivets and Burrs—

Copper .....40¢@2½¢
Iron or Steel.....75@75&5%

Bifurcated and Tubular—

Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 23@25¢; Tin boxes, 29@32¢.
Tubular, per doz. boxes, 50 count, 29@32¢; 100 count, 51@58¢.

Rollers—

Acme, Stowell's Anti-Friction.....50%
Cronk's Stay No. 65, $0.90; No. 50 .....$1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56.....$0.84
Lane's Stay.....40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57.....50%
Underwriters', Nos. 59, 60.....50%
Favorite, No. 54.....60%
Stowell's Barn Door Stay..₩ doz. $1.00
Swett's Anti-Friction.....50%
Screw and Spike Stay.....₩ doz. 65¢
Hinge Adjustable Stay.....₩ doz. 90¢

Rope—

Manila, 7-16 in. diam. and larger:
Pure .....*lb.,* 12½¢
Sisal, 7-16 in. diam. and larger:
Pure .....*lb.,* 9¢
Sisal, 7-16 in. diam. and larger:
No. 2 quality.....*lb.,* 7¾@8¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse:
Mixed .....*lb.,* 7¾@8¢
Pure .....*lb.,* 9¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred:
Mixed .....*lb.,* 7¾@8¢
Pure .....*lb.,* 9¢
Cotton Rope:
*Best, ¼-in. and larger.*16½@18¢
Medium, ¼-in. and larger, 15½@16½¢
*Common, ¼-in. and larger..*10¢
In coils, ½¢ advance.
Jute Rope:
Thread, No. 1, ¼-in. & up, lb., 8@8¼¢
Thread, No. 2, ¼-in. & up, lb.. 7½@7¾¢
Old Colony Manila Transmission Rope .....₩ lb 17½¢

Wire Rope—

Galvanized .....57½&2½%
Plain .....45&2½%

Ropes, Hammock—

Covert Mfg. Co.:
Jute, 45%; Sisal.....33⅓%

Rules

Boxwood .....60@60&10%
Ivory .....35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexifold .....27½&10&10%
Ivory .....35@35&10&10%
Miscellaneous .....50@50&10&10%
Stephens' Combination.....55@55&10%
Stationers' .....10@10&10%
Keuffel & Esser Co.:
Folding, Wood.....35&10%
Folding, Steel.....33⅓&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....60%
Stanley R. & L. Co.:
Boxwood 60%
Ivory 45%
Miscellaneous 60%
Zig Zag.....40%
Zig Zag, Pin Joint.....42½%
Upson Nut Co.:
Boxwood .....60@60&10%
Ivory .....35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—
See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 50%
Band .....50&10@60%
Cross Cuts.....35&5%
Mulay, Mill and Drag.....50%
One-Man Saw, 40%; Wood Saws, 40%; Hand, Compass, &c., 40%.
Chapin-Stephens Co.:
Turning Saws and Frames..30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws.....30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth.50%
Band, 2 to 14 in. wide.....60%
Band, ¼ to 1¾.....60%
Crosscuts 45%
Narrow Crosscuts.....50%
Mulay, Mill and Drag.....50%
Framed Woodsaws.....25%
Woodsaw Blades.....25%
Woodsaw Rods.....25%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8.....25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination.....30%
Compass, Key Hole, &c.....25%
Butcher Saws and Blades.....30%
C. E. Jennings & Co.'s:
Back Saws.....25%
Butcher Saws.....30%
Compass and Key Hole Saws..35&5%
Framed Wood Saws.....30%
Hand Saws.....20&2½%
Wood Saw Blades.....35%
Millers Falls:
Butcher Saws.....15&10%
Star Saw Blades.....15&10%
Massachusetts Saw Works:
Victor Kitchen Saws.....40&10&50%
Butcher Saws Blades.....35@40
Peace & Richardson's Hand Saws...30%
Simonds':
Circular Saws.....50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts.....40&10%
Gang Mill, Mulay and Drag Saws.50%
Band Saws.....50%
Back Saws.....25@25&7½%
Butcher Saws.....35@35&7½%
Hand Saws.....25@25&7½%
Hand Saws, Bay State Brand.....45%
Compass, Key Hole, &c..25@25&7½%
Wood Saws.....40&7½%
Wheeler, Madden & Clemaen Mfg. Co.'s Cross Cut Saws.....50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A..25%
Disston's:
Concave Blades.....25%
Keystone Blades.....35%
Hack Saw Frames.....30%
Fitchburg File Works, The Best...35%
C. E. Jennings & Co.'s
Hack Saw Frames, Nos. 175, 180.....40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades.....40%
Griffin's Hack Saw Frames..35&5&10%
Griffin's Hack Saw Blades....35&5&10%
Star Hack Saws and Blades.....15&10%
Sterling Hack Saw Blades....30&10&5%
Sterling Hack Saw Frames...30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00..10%
Victor Hack Saw Blades.....25%
Victor Hack Saw Frames.....40%

Scroll—

Barnes, No. 7, $15.....25%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20.....20%
Lester, complete, $10.50.....15&10%
Rogers, complete, $3.50 and $4.00..15&10%

Scales—

Family, Turnbull's....50@50&10%
Counter:
Hatch, Platform, ½ oz. to 4 lbs. .....doz. $5.50
Two Platforms, ½ oz. to 8 lbs. .....doz. $18.00
Union Platform, Plain.$1.70@1.90
Union Platform, Stpd.$1.85@2.15
Chatillon's:
Eureka 25%
Favorite 40%
Grocers' Trip Scales.....50%
Chicago Scale Co.:
The Little Detective.....25 lbs 50%
Union or Family No. 2.....
Portable Platform (reduced list)..50%
Wagon or Stock (reduced list)..25@35%
The Standard Portables.....45%
The Standard R. R. and Wagon .....50&10%

Scrapers—

Box, 1 Handle.....doz. $2.00@2.25
Box, 2 Handle.....doz. $2.50@2.60
Ship....Light, $2.00; Heavy, $4.50
Adjustable Box Scraper (S. R. & L. Co.), $6.00.....45%
Chapin-Stephens Co., Box, 30@30&10&10%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1⅛, $3.00@3.25; 1¼, $3.50@3.75
Bench Wood .....25@25&5%
Hand, Wood .....25@25&5%
R. Bliss Mfg. Co., Hand....30@30&10%
Chapin-Stephens Co., Hand.....25%

Coach, Lag and Hand Rail—

Lag, Cone Point, list Oct. 1, '99 .....75&15%
Coach, Gimlet Point, list Oct. 1, '99 .....75&10%
Hand Rail, list Jan. 1, '81.... 70&10@75%

Jack Screws—

Standard List.....75%
Millers Falls.....50&10&10%
P., S. & W.....50%
Swett Iron Works.....75@80%

Machine—

List Jan. 1, '98:
Flat or Round Head, Iron.... 50@50&10%
Flat or Round Head, Brass.... 50@50&10%

Set and Cap—

Set (Iron).....80&7½%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap.....75&10&7½%
Hex. Hd. Cap.....75&10&7½%
Rd. Hd. Cap.....60&10%
Fillister Hd. Cap.....60&10&10%

Wood—

List July 23, 1903.
Flat Head, Iron.....87½&10@..%
Round Head, Iron...85 &10@..%
Flat Head, Brass.....82½&10%
Round Head, Brass..80 &10@..%
Flat Head, Bronze...77½&10@..%
Round Head, Bronze.75 &10@..%
Drive Screws.....87½&10%

Scroll Saws—
See *Saws, Scroll.*

Scythes—

	Per doz.
Grass, No. 1, Plain	$6.25@6.75
Clipper, Bronzed Webb	$6.50@7.00
No. 3 Clipper, Pol'd Webb	$6.75@7.25
No. 6 Clipper and Solid Steel	$7.00@7.50
Bush, Weed and Bramble, No. 2	$6.50@7.00
Grain, No. 1	$8.25@8.75
Bronzed Webb, No. 1	$8.50@9.00
Nos. 3 and 4 Clipper, Grain	$8.75@9.25
Solid Steel, No. 6	$9.25@9.75

Seeders, Raisin—

Enterprise .....25@30%

Sets— Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $13; 3, $12; 4, $9; 5, $7.....50%
C. E. Jennings & Co.'s Model Tool Holders 30%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18....15&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel.....₩ doz sets $9.00

Sets, Nail—

Octagon .....gro. $3.50@3.75
Buck Bros.....27½%
Cannon's Diamond Point, ₩ gro.$12.40%
Mayhew's .....₩ gro. $9.00
Snell's Cor'gated, Cup Pt....₩ gro. $7.20
Snell's Knurled, Cup Pt....₩ gro. $7.20
Victor Knurled Cup Pt....₩ gro. $7.50

Rivet—

Regular list .....75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Bemis & Call Co.'s:
Cross Cut.....30%
Plate 20%
Disston's Star, Monarch and Triumph 30%
Morrill's No. 1.....$15.00 } 50%
Nos. 3 and 4, Cross Cut....$20.60 } 50%
No. 5, Mill.....$30.00 } 50%
Nos. 10, 11, 95.....$15.60 } 50%
No. 1 Old Style.....$10.00 } 50%
Special .....$16.25 } 50%
Giant Royal Cross Cut....₩ doz. $8.00
Royal, Hand.....₩ doz. $4.50
Taintor Positive.....₩ doz. $6.75

Shaving—

Fox Shaving Sets, No. 30 .....
₩ doz., net, $24.00
Smith & Hemenway Co.'s.....60%

Sharpeners, Knife—

Chicago Wheel & Mfg. Co.....70%
Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₩ doz.....$1.50 } 50%
Mounted Kitchen Sand Stone, ₩ doz.....$1.50 } 50%
Natural Grit Carving Knife Hones, ₩ doz.....$3.00 } 50%
Quick Cut Emery Carving Knife Hones, ₩ doz.....$1.50 } 50%
Quick Edge Pocket Knife Hones, ₩ doz.....$2.50 } 50%

Skate—

Smith & Hemenway Co., Eureka..20%

Shaves, Spoke—

Iron .....doz.$1.10@1.25
Wood .....doz.$1.75@2.25
Bailey's (Stanley R. & L. Co.)....45%
Razor Edge (Stanley R. & L. Co.), Iron, 50%; Wood.....55%
Chapin-Stephens Co.....30@30&10&10%
Goodell's ₩ doz. $9.00.....15&10%
Wood's F1 and F2.....50%

Shears—

	7	8	9 in.	
Cast Iron..				
Best	$16.00	18.00	20.00	gro.
Good	$13.00	15.00	17.00	gro.
Cheap	$5.00	6.00	7.00	gro.

Straight Trimmers, &c.:
Best quality Jap....70@70&10%
Best quality, Nickel..60@60&10%
Fair quality, Jap....80@80&5%
Fair quality, Nickel..75@7'&10%
Tailors' Shears.....40@40&10%
Acme Cast Shears.....40@40&5%
Heinisch's Tailor's Shears.....10%
Wilkinson Shear & Cutlery Co.:
Sheep, 1900 list.....30&10&5%
Grass .....50&10%
Horse or Mule.....50&10%

Tinners' Snips—

Steel Blades.....20&5@20&10%
Steel Laid Blades.....40&10@50%
Forged Handles, Steel Blades, Berlin, 50%
Heinisch's Snips.....40%
Jennings & Griffin Mfg. Co.'s, 6½ to 10 in.....50%
Niagara Snips.....40%
P., S. & W. Forged Handles.....20%

Pruning Shears—

Cronk's Hand Shears.....33⅓%
Cronk's Wood Handle Shears.....33⅓%
Disston's Combined Pruning Hook and Saw, ₩ doz. $18.00.....25%
Disston's Pruning Hook only, ₩ doz. $12.00 .....25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades.....50%
P., S. & W. Co.....30%
Wilkinson Shear & Cutlery Co.:
Hedge, Wilcut Brand.....60&10%
Lawn and Border, Wilcut Brand. 60&10%

Sheaves—Sliding Door—

Stowell's Anti-Friction.....50%
Reading 40%
R. & E. list.....33⅓%
Wrightsville Hatfield Pattern.....80%

Sliding Shutter—

Reading list.....40%
R. & E. list.....33⅓%

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, Club, Rival, 10 and 12 gauge .....65&5%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge..25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge 20%
Climax, Union, League, New Rival, 10 and 12 gauge.....25%
Climax, Union, League, New Rival, 14, 16 and 20 gauge.....20%
Expert, Metal Lined and Pigeon, 10 12, 16 and 20 gauge.....33⅓&5%
Robin Hood, Low Brass.....20&5%
Robin Hood, High Brass.....30&5%
Indian, for Black Powder.....25&5%

Shells, Loaded—

Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade.....40&5%
Loaded with Smokeless Powder, high grade.....40&10&10%
Robin Hood Smokeless Powder:
Robin Hood, Low Brass.....50%
Comets, High Brass.....50&10&5%
Indian, Black Powder.....40&5%

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron .....per keg $4.00
Steel .....per keg $3.75
Burden's, all sizes.....₩ keg $3.90

Shot—

	25-lb. bag.
Drop, up to B	$1.90
Drop, B and larger	2.15
Buck	2.15
Chilled	2.15
Dust	2.35

Shovels and Spades—

Association List, Nov. 15, 1902..40%

Snow Shovels—

Long Handle.....$2.75@3.00
Wood and Mall, D. Handle. $3.25@3.50

Sieves and Sifters—

Hunter's Imitation..... gro.$9.50@10.00
Hunter's Genuine..... per gro. $12.00@13.50
Buffalo Metallic Blued, R. M. Co., ₩ gr.

14&16	16&18	18&20
$13.20	$13.50	$14.40

Sieves, Seamless Metallic

—Per dozen.—

Mesh	14	16	18	20
Iron Wire	$1.05	1.05	1.10	1.20
Tinned Wire	$1.15	1.15	1.20	1.30

Sieves, Wooden Rim—
Nested, 10, 11 and 12 Inch.
Mesh 18, Nested....doz. $0.90@0.95
Mesh 20, Nested....doz. $1.00@1.05
Mesh 24, Nested....doz. $1.30@1.40

Shingles, Metal— Per. Sqr.

Wheeling Corrugating Co.:

	Painted.	Galv.
Dixie, 7 x 10 in.	$5.90	$7.00
Dixie, 10 x 14 in.	5.10	6.35
Dixie, 14 x 20 in.	4.75	5.65

Sinks, Cast Iron—

Painted, Standard, list:
12 x 12 to 22 x 36 in....60&5%
20 x 40 to 24 x 50 in.....55%
24 x 60 to 24 x 120 in.....35%
Barnes' low list:
Up to and including 20 x 36 in....60%
20 x 40 to 24 x 50 in.....55%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron.....70@75&10%
Steel .....40@45%

Slates, School—
Factory Shipments.
"D" Slates.....50@50&10%
Eureka, Unexcelled Noiseless.. 60&5 tens
Victor A, Noiseless.60&4 tens &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German .....40@40&10%
Covert Mfg. Co.:
Derby, 30&2%; Yankee, 30&2%; Yankee Roller, 30&2%.
High Grade, 45%; Trojan.....45%
Jockey 35%
Oneida Community:
Harness Snaps, 1 inch.....60&5%
Swivel Snaps.....60%
Swivels 50%

Snaths—

Scythe 50%

Snips, Tinners—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality.....50&10@60&5%
Cheap .....60@60&10%
International Silver Co.:
1847 Rogers Bros. and Rogers & Hamilton .....40&10%
Rogers & Bro., William Rogers' Eagle Brand.....50&10%
Anchor, Rogers Brand.....60%
Wm. Rogers & Son.....60&10%

Miscellaneous—

German Silver.....60@60&5%
Cattaraugus Cutlery Co.:
Seneca Silver.....50%

Tinned Iron—

Teas .....per gro. 45@50¢
Tables.....per gro. $0.50@$1.00

Springs— Door—

Chicago (Coil).....40&10%
Gem (Coil).....20%
Pullman (Coil).....35%
Reliance (Coil).....40&10%
Star (Coil).....30%
Torrey's Rod, 39 in.....₩ doz. $1.10

Carriage, Wagon, &c.—

	Per lb
1½ in. and Wider:	
Black	4@4¼¢
Half Bright	4@4¼¢
Bright	4½@4¾¢

Painted Seat Springs:
1½ x 2 x 26.....per pr. 42¢
1½ x 3 x 28.....per pr. 70¢

Sprinklers, Lawn—

Enterprise .....25@30%
Philadelphia No. 1, ₩ doz. $12; No. 2, $15; No. 3, $24.....30%
Pleuger & Henger Mfg. Co.:
Cactus, 70%; Japanese, 75%; Nationals, 65%.

Squares—

Nickel plated.. } List Jan. 5, 1900.
Steel and Iron. } 75@80%
Rosewood Hdl. Try Square and T-Bevels .....60&10&10@70%
Iron Hdl. Try Squares and T-Bevels .....40&10@40&10&10%
Disston's Try Squares and Bevels, Rosewood Handle, 67½%; Iron Stock and Bevel.....20%
Winterbottom's Try and Miter, No. 1, 35%; No. 2.....45%

Squeezers, Lemon

Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap .....doz. $1.00
Good Grade.....doz. $1.25
Tinned Iron.....doz. $0.75@1.25
Iron, Porcelain Lined...doz. $1.75

Staples—

Barbed Blind.....lb. 6@6½¢
Electricians', Association list.. 80&10&10&10%
Fence Staples, Plain, $2.25; Galvanized $2.55
Poultry Netting Staples..... per lb. 3¼@3½¢
Grand Crossing Tack Co.'s list..80&10%

Steels, Butchers'—

Dick's 30%
Foster Bros.....30%
C. & A. Hoffmann's.....40%

Steelyards— ....30@30&10%

Stocks and Dies—

Blacksmiths' .....50@50&10%
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates.....25%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25%

Stoners, Cherry—

Enterprise .....25@30%

Stones—Oil, &c.

Chicago Wheel & Mfg. Co., 1904 list:
Gem Corundum Oil, Double Grit.60%
Gem Corundum Axe, Single or Double Grit.....60%
Gem Corundum Slips.....60%
Gem Corundum Razor Hones....50%
Pike Mfg. Co., 1904 list:

	₩ lb.	
Arkansas St. No. 1, 3 to 5½ in.	$2.00	33⅓%
Arkansas St. No. 1, 5½ to 8 in.	$3.50	
Arkansas Slips No. 1	$4.00	
Lily White Washita, 4 to 8 in.	60¢	
Rosy Red Washita, 4 to 8 in.	60¢	
Washita St., Extra, 4 to 8 in.	50¢	
Washita St., No. 1, 4 to 8 in.	40¢	
Washita St., No. 2, 4 to 8 in.	30¢	
Lily White Slips	90¢	
Rosy Red Slips	90¢	
Washita Slips, Extra	80¢	
Washita Slips, No. 1	70¢	
Washita Slips, No. 2	40¢	
India Oil Stones (entire list)		33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit		33⅓%
Quickcut Emery and Corundum Axe Stone, Double Grit		33⅓%
Quickcut Emery Rubbing Bricks		33⅓%
Hindostan No. 1, R'g'lar.	₩ lb 8¢	
Hindostan No. 1, Small	₩ lb 10¢	
Axe Stones (all kinds)		
Turkey Oil Stones, Extra, 5 to 8 in.	₩ lb. 80¢	33⅓%
Queer Creek Stones, 4 to 8 in.	20¢	
Queer Creek Slips	40¢	
Sand Stone	6¢	

Scythe Stones—

Chicago Wheel & Mfg. Co.:
Gem Corundum, 10 in., $8.00 ℔ gro., 12 in., $10.80.
Norton Emery Scythe Stones:
Less than gross lots.....℔ gro. $9.00
One gross or more.....℔ gro. $7.20
Lots of 10 gross or more..℔ gro. $6.00
Pike Mfg. Co., 1901 list:
Black Diamond S. S..℔ gro. $12.00
Lamoille S. S.....℔ gro. $11.00
White Mountain S. S.℔ gro. $9.00
Green Mountain S. S.℔ gro. $6.00
Extra Indian Pond S.S.℔ gro. $7.50
No. 1 Indian Pond S.S.℔ gro. $7.00
No. 2 Indian Pond S.S.℔ gro. $4.50
Leader Red End S. S.℔ gro. $4.50
Quick Cut Emery....℔ gro. $10.00
Pure Corundum,.....℔ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat. $8
Emery Scythe Rifles, 3 Coat. $10
Emery Scythe Rifles, 4 Coat. $12
Balance of 1904 list 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers.....℔ gro. $9.00

Stops— Bench—

Millers Falls.....15&10%
Morrill's, ℔ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

Door—

Chapin-Stephens Co.....60@60&10%

Plane—

Chapin-Stephens Co.....20%

Straps— Box—

Cary's Universal, case lots.....25&20%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket .....doz. $1.80
Bullard, ℔ doz.....$4.00
Excelsior Stretcher and Tack Hammer Combined, ℔ doz. $6.00.....20%

Strops, Razor—

Star Diagonal Strop.....25%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Co., list Jan. 1 1902 .....30&5%

Sweepers, Carpet—

National Sweeper Co.: ℔ doz.
Louis XV, Roller Bearing, Gold Plated $120.00
Hepplewhite, Roller Bearing, Silver Plated.....$72.00
Sheraton, Roller Bearing, N'kel.$60.00
Ye Mission, Roller Bearing, Oxidized Coppered.....$36.00
Transparent, Roller Bearing, Plate Glass top, Nickeled.....$36.00
National Queen, Roller Bearing, Fancy Veneers.....$27.00
Loyal, Roller Bearing, Veneers, Nickeled $25.00
Triple Medal, Roller Bearing, Nickeled $24.00
Marion, Roller Bearing, N'kel.$24.00
Marion Queen, Roller Bearing, Nickeled $24.00
Monarch, Roller Bearing, N'kel.$22.00
Monarch, Roller Bearing, Jap..$20.00
Perpetual, Regular B'r'gs, N'kel.$20.00
Perpetual, Regular B'r'gs, Jap..$18.00
Monarch Extra (17 in. case), Roller Bearing, Nickeled.....$36.00
Monarch Extra (17 in. case), Roller Bearing, Japanned.....$33.00
Auditorium (26 in. case), Roller Bearing, Nickeled.....$54.00
Mammoth (30 in. case), Roller Bearing, Nickeled.....$60.00

NOTE.—Rebates: 50c per dozen on three-dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five-dozen lots.

Streator Metal Stamping Co.:
Eureka Japanned.....℔ doz. $15.00
Model E, Sanitaire.....℔ doz $25.00
Model A, Sterling.....℔ doz. $25.00
Model B, Sterling, Nickeled..... ℔ doz. $23.00
Model B, Sterling, Japanned..... ℔ doz. $21.00
Model C, Sterling.....℔ doz. $21.50
Model D, Sterling.....℔ doz. $19.50

Tacks, Finishing Nails, &c.

New List, May 1, 1905.
American Carpet Tacks..... 90&40@—%
American Cut Tacks..90&40@—%
Swedes Cut Tacks....90&40@—%
Swedes Upholsterers'..80&50@—%
Gimp Tacks.....90&50@—%
Lace Tacks.....90&40@—%
Trimmers' Tacks.....90&40@—%
Looking Glass Tacks....65@—%
Bill Posters' and Railroad Tacks, 90&50@—%
Hungarian Nails.....85@—%
Finishing Nails.....70&10@—%
Trunk and Clout Nails..80@—%

NOTE.—The above prices are for Standard Weights. An extra 5% is given on Medium Weights, and an extra 10&5% is given on light weights.

Miscellaneous—

Double Pointed Tacks..... 90&5 or 6 tens
See also Nails, Wire.

Tanks, Oil— Each.

Emerald, R. M. Co.....30-gal. $3.40
Emerald, R. M. Co.....60-gal. $4.25
Queen City, R. M. Co.....30-gal. $3.65
Queen City, R. M. Co.....60-gal. $4.50

Tapes, Measuring—

American Asses' Skin ..50@—%
Patent Leather.....25@30&5%
Steel .....$3 1-3&5%
Chesterman's .....25@25&5%
Keuffel & Esser Co.:
Favorite, Ass Skin.....40&10@50%
Favorite, Duck and Leather..... 25&5@25&10%
Metallic and Steel, lower list, 25@35&5%; Pocket, 35@35&5%.

Lufkin's:
Asses' Skin.....40&10@50%
Metallic .....30@30&5%
Patent Bend, Leather....25&5@25&10%
Pocket .....40@40&5%
Steel .....33⅓&35%
Wiebusch & Hilger:
Chesterman's Metallic, No. 34L, etc. 25%
Chesterman's Steel, No. 1038L, etc. 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case.....80&10@80&10&5%

Ties, Bale—Steel Wire—

Single Loop.....80&2½%
Monitor, Cross Head, &c....70%

Brick Ties—

Niagara Brick Ties.....25&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Hay—

Myers' Hay Tools.....50%
Stowell's Hay Carriers, 50%; Hay Forks, 50%; Fork Pulleys, 50%.

Miniature—

Smith & Hemenway Co.'s, Davidson 25%

Saw—

Atkins' Cross Cut Saw Tools.....40%
Simonds' Improved.....33⅓%
Simonds' Crescent.....25%

Ship—

L. & I. J. White.....35%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida.....75@75&5%
Newhouse .....45@45&5%
Hawley & Norton.....65%
Victor .....70&10%
Oneida Community Jump.....50%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 8½@9¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, each $1.21; ℔ doz. $15.25
No. 3, Rat, ℔ doz. $6.50; case of 50 $5.75 doz.
No. 3½, Rat, ℔ doz. $5.25; case of 72 ℔ gro. $4.70 doz.
No. 4, Mouse, ℔ doz. $3.85; case of 150 $3.00 doz.
No. 5, Mouse, ℔ doz. $3.00; case of 150 $2.25 doz.

Trimmers, Spoke—

Wood's E I.....50%

Trowels—

Disston Brick and Pointing.....25%
Disston Plastering.....20%
Disston "Standard Brand" and Garden Trowels.....30%
Kohler's Steel Garden Trowels, ℔ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels.. ℔ gro. $6.00
Rose Brick and Plastering.....25&5%
Woodrough & McParlin, Plastering.25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern.....50&10%
Western Pattern.....60&10%
Handy Trucks.....℔ doz. $16.00
Grocery .....℔ doz. $15.00
Daisy Stove Trucks, Improved Pattern .....℔ doz. $18.50
McKinney Trucks.....each $10.00
Model Stove Trucks.....℔ doz. $18.50

Tubs, Wash— *No. 1 2 3*

Galvanized, per doz. $4.25 4.75 5.25
Galvanized Wash Tubs (R. M. Co.):
No. 1 2 3 10 20 30
Per doz., net.$5.70 6.30 7.20 6.60 7.20 8.10

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls..22@24¢
No. 12, ¼ and ½-lb. Balls..19@21¢
No. 18, ¼ and ½-lb. Balls..17@19¢
No. 24, ¼ and ½-lb. Balls..16@18¢
No. 36, ¼ and ½-lb. Balls..15@17¢
Chalk Line, Cotton ½-lb. Balls .....25@30¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz.....10@18¢
Cotton Wrapping, 5 Balls to lb., according to quality..14½@20¢
American 2-Ply Hemp, ¼ and ½-lb. Balls.....13@14¢
American 3-Ply Hemp, 1-lb. Balls .....13@14¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine)....9@10¢
India 3-Ply Hemp, 1-lb. Balls 9@10¢
India 3-Ply Hemp, 1½-lb. Balls. 8½@9½¢
2, 3, 4 and 5-Ply Jute, ½-lb. Balls .....10½@12¢
Mason Line, Linen, ½-lb. Bls.46¢
No. 24 Mattress, ¼ and ½-lb. Balls .....37¢
Wool, 3 to 6 ply...B 7½¢; A 8½¢

Vises—

Solid Box.....60%

Parallel—

Athol Machine Co.:
Simpson's Adjustable.....40%
Standard 40%
Amateur 25%
Columbian Hdw. Co.....40%
Emmert Universal:
Pattern Makers' No. 1, $15.00; No. 2, $12.50.
Machinist and Tool Makers' No. 4A, $12.50; No. 5A, $7.00; No. 6A, $10.00; No. 10A, $22.50.
Presto Quick Acting.....25@25&5%
Tiger Machinists'.....40%
Fisher & Norris Double Screw..15&10%
Hollands':
Machinists' .....40@40&5%
Keystone .....65&10@70%
Lewis Tool Co.:
Adjustable Jaw.....30%
Monarch, 50%; Solid Jaw.....50%
Massey Vise Co.:
Clincher 40%
Perfect, 20%; Lightning Grip.....20%
Merrill's 20%
Millers Falls Oval Slide Pattern.60&10%
Parker's:
Victor, 20@25%; Regulars.....20@25%
Vulcan's .....40@45%
Combination Pipe.....55@60%
Prentiss .....20@25%
Snediker's X. L.....33⅓%
Stephens' 33⅓%

Saw Filers—

Disston's D 3 Clamp and Guide, ℔ doz., $24.00, 30%; Clamps.....30%
Perfection Saw Clamps, ℔ doz....$4.50
Reading 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3.....50%

Wood Workers—

Massey Vise Co.:
Lightning Grip, 15%; Perfect.....15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Bignall & Keeler Combination Pipe Vise .....60&10%
Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe.....40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870, 40%.

Wads—*Price per M.*

B. E., 11 up.....60¢
B. E., 9 and 10.....70¢
B. E., 8.....80¢
B. E., 7.....80¢
P. E., 11 up.....$1.00
P. E., 9 and 10.....1.25
P. E., 8.....1.50
P. E., 7.....1.50
Dis. 15%
Ely's B. E., 11 and larger..$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware:
Enameled 55%
Ground 60%
Plain or Unground.....65%
Country Hollow Ware, per 100 lbs. $2.75
White Enameled Ware:
Maslin Kettles.....70%
Covered Wares
Tinned and Turned.....40%
Enameled 50%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware.....60%
Iron Clad Ware.....70&10%
Lava, Enameled.....40&10%
Never Break Enameled.....50%

Tea Kettles—

Galvanized Tea Kettles:
Inch..... 6 7 8 9
Each .....45¢ 50¢ 55¢ 65¢

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles.....60%
Porcelained .....50&5@50&10%
Never Break Spiders and Griddles.. 65&5%
Never Break Kettles.....60%
Solid Steel Spiders and Griddles.65&5%
Solid Steel Kettles.....60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc: ℔ doz.
Crescent, family size, bent frame.$3.25
Red Star, family size, stationary protector $3.25
Double Zinc Surface:
Saginaw Globe, family size, stationary protector.....$2.90
Cable Cross, family size, stationary protector.....$3.15
Single Zinc Surface:
Naiad, family size, open back, perforated $2.65
Saginaw Globe, protector, family size, ventilated back.....$2.50
Brass Surface:
Brass King, Single Surface, open back $3.25
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.25
Glass Surface:
Glass King, Single Surface, open back $3.25
Enamel Surface:
Enamel King, Single Surface, ventilated back.....$3.25

Washers—Leather, Axle—

Solid .....80&10@80&10&10%
Patent .....90@90&5%
Coil: ⅞ 1 1⅛ 1¼ Inch.
10¢ 11¢ 12¢ 13¢ per box

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers ..$5.40 4.50 3.20 3.00 2.80
The above prices are based on $6.00 off list.

In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1¾@2¢

Weather Strip—

Flexible Felt—

Lined, per 100 ft., $2; $3; $4.....40&10%
Moore's Unlined, per 100 ft., $2; $3; $4 .....50&10%

Wedges—

Oil Finish.....lb. 2.70@2.80¢

Weights—Hitching—

Covert Mfg. Co.....40%

Sash—

Per ton, f.o.b. factory:
Eastern District...$27.50@$28.00
Southern Territory.$20.00@$23.00
Western and Central Districts .....$23.00@$25.00

Wheels, Well—

8-in., $1.55; 10-in., $2.00; 12-in., $2.50; 14-in., $4.00.

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....80%
10 to 18.....80&2½%
19 to 26.....80&7½%
27 to 36.....80&2½%
Galvanized:
6 to 9.....75&5%
10 to 14.....75&7½%
15 to 16.....72½&10&2½%
19 to 26.....75%
27 to 36.....72½%
Coppered:
6 to 9.....75&5%
10 to 14.....75&7½%
15 to 18.....72½&10&2½%
19 to 26.....75&10&5%
27 to 36.....75%
Tinned:
6 to 14.....75&10&2½%
15 to 18.....75&7½%
Annealed, Steel and Tinned, on Spools ..70&10&10@70&10&10&10%
Brass and Copper on Spools... 60&5@60&10&5%
Brass .....Net list.
Cooper 10%
Cast Steel Wire.....50%
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

List June 24, '03.....90@90&10%
Brass Cup Hooks and Brass Screw Hooks.....85@—%

Wire Cloth and Netting—

Galvanized Wire Netting..... 80&5@80&10%
Painted Screen Cloth, 100 ft., $1.00@1.10
Standard Galv. Hardware Grade:
Nos. 2, 2½ & 3 Mesh, sq. ft..3 ¢
Nos. 4 and 5 Mesh, sq. ft..3½¢
No. 6 Mesh, sq. ft.....3½¢
No. 8 Mesh, sq. ft.....4 ¢

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural .....80@80&5%
Alligator or Crocodile..70&10@75%
Baxter Pattern S Wrenches... 70&5@70&10%
Drop Forged S.....45@45&5%
Acme .....60&10%
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Bemis Pipe.....60%
Combination Black.....40&5%
Merrick Pattern.....50%
Boardman's 40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle..... 40&10&5&5%
Coes' "Mechanics'"...40&10&10&5&5%
Donohue's Engineer.....40&10%
Eagle .....50&10%
Elgin Wrenches, ℔ doz.....$6.25
Elgin Rethreading Attachment, only with one die, ℔ doz.....$6.25
Elgin Extra Dies, ℔ doz.....$3.00
Elgin Extra Jaws, ℔ doz.....$1.75
Elgin Monkey Wrench Pipe Jaws, ℔ doz.....$2.10
Gem Pocket.....30%
Hercules 70%
W. & B. Machinist:
Case lots.....50&5%
Less than case lots.....50%
W. & B. Railroad Special:
Case lots.....50%
Less than case lots.....40&10&5%
Solid Handles, P., S. & W.....50&5%
Stillson 65%
Vulcan Chain.....50%

Fruit Jar—

Triumph Fruit Jar Wrench, 5 gross lots, ℔ gross, $7.50; ℔ doz.....$0.80

Wringers—

Tuttle Roller Press Mop Pail Wringer, each, $8.00; ℔ doz.....$48.00

Wrought Goods—

Staples, Hooks, &c., list March 17, '98.....90@90&10%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers' & Freighters' .....list net

Zinc—

Sheet.....per 100 lbs., $8.15@8.40

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:	
1 to 1⅞ in. round and square; 1½ to 4 in. x ⅜ to 1 in.	₩ ℔ 2.10¢
1½ to 4 in. x ¼ to 5-16	₩ ℔ 2.30¢
Rods—⅜ and 11-16 round and square	₩ ℔ 2.30¢
Angles:	Cts ₩ ℔
3 in. x ¼ in. and larger	2.40¢
(except 3½ in. and 4 x ¼ 2.50¢)	
3 in. x 3-16 in. and ⅛ in.	2.55¢
1½ to 2½ in. x ⅛ in.	2.35¢
1½ to 2¾ in. x 3-16 in. and thicker	2.30¢
1 to 1¼ in. x 3-16 in.	2.35¢
1 to 1¼ x ⅛ in.	2.40¢
⅞ x ⅛ in.	2.55¢
¾ x ⅛ in.	2.65¢
⅝ x ⅛ in.	3.70¢
½ x 3-32 in.	4.20¢
Tees:	
1 in.	2.65¢
1¼ in.	2.45¢
1½ to 2½ in.	2.35¢
3 in. and larger	2.50¢
Beams	2.40¢
Channels, 3 in. and larger	2.40¢
Bands—1½ to 6 x 3-16 to No. 8	2.35¢
"Burden's Best" Iron, base price	3.05¢
Burden's "H. B. & S." Iron, base price	3.00¢
"Ulster"	3.10¢
Norway Bars	3.40¢
Norway Shapes	3.80¢

Merchant Steel from Store—

	per ℔
Bessemer Machinery	2.00¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black

	One Pass, C.R. Soft Steel.	R. G. Cleaned.
No. 14	₩ ℔ 2.90	3.00¢
Nos. 18 to 21	₩ ℔ 3.05	3.10¢
No. 27	₩ ℔ 3.20	3.50¢
No. 28	₩ ℔ 3.30	3.60¢

Russia, Planished, &c.

Genuine Russia, according to assortment	₩ ℔ 11¾@14¢
Patent Planished	₩ ℔ A, 10¢; B, 9¢, net.

Galvanized.

Nos. 14 to 16	₩ ℔, 3.25¢
Nos. 22 to 24	₩ ℔, 3.65¢
No. 27	₩ ℔, 4.10¢
No. 28	₩ ℔, 4.35¢

No. 20 and lighter 36 inches wide, 25¢ higher.

Tin Plates—

American Charcoal Plates (per box.)

A.A.A. Charcoal:	
IC, 14 x 20	$6.60
IX, 14 x 20	7.85
A. Charcoal:	
IC, 14 x 20	$5.65
IX, 14 x 20	6.75

American Coke Plates—Bessemer—

IC, 14 x 20.....108 ℔	$4.65
IX, 14 x 20	6.65

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$9 00
IX, 20 x 28 with an 8 lb. coating	11.00

Seamless Brass Tubes—

List December 4, 1905. Base price 25c.

Brass Tubes, Iron Pipe Sizes—

List December 4, 1905. Base price 25c.

Copper Tubes—

List December 4, 1905. Base price 29c.

Brazed Brass and Bronze Tubes—

List June 6, 1898. Discount 17½%.

High Brass Rods—

Discount 10%.

Roll and Sheet Brass—

List June 6, 1898. Discount 5%.

METALS—

Tin—

Straits Pig	₩ ℔ 41¼@42 ¢

Copper—

Lake Ingot	₩ ℔ 23 @24 ¢
Electrolytic	₩ ℔ 22 @23 ¢
Casting	₩ ℔ 21 @22 ¢

Sheet Copper Hot Rolled, 16 oz	₩ ℔ 27¢
" " " 14 "	" " 28¢

Sheet Copper Cold Rolled, 1¢ ₩ ℔ advance over Hot Rolled.
Sheet Copper Polished 20 in. wide and under, 1¢ advance over Cold Rolled.
Sheet Copper Polished over 20 in. wide, 2¢ advance over Cold Rolled.

Bottoms, Pits and Flats	₩ ℔ 3.¢ basis
Planished Copper, 1¢ ₩ ℔ more than Polished.	

Spelter—

Western	₩ ℔ 6¾ @ 7 ¢

Zinc.

No. 9, base, casks, ₩ ℔ 8.40¢ | Open	₩ ℔ 8.90¢

Lead.

American Pig	₩ ℔ 6¾@6¾¢
Bar	₩ ℔ 7 @7¼¢

Solder.

½ & ½, guaranteed	₩ ℔ 25½@26 ¢
No. 1	₩ ℔ 23½@24 ¢
Refined	19½@20½¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₩ ℔ 27@28¢
Halletts	26@27¢
Other Brands	24@25¢

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:

Small lots	40c
100-℔ lots	38c

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy Cut and Crucible	₩ ℔ 19.00@19.75¢
Copper, Heavy and Wire	₩ ℔ 18.25@19.00¢
Copper, Light and Bottoms	₩ ℔ 17.50@18.00¢
Brass, Heavy	₩ ℔ 13.00@13.50¢
Brass, Light	₩ ℔ 11.50@12.00¢
Heavy Machine Composition	₩ ℔ 18.00@19.00c
Clean Brass Turnings	₩ ℔ 13.00@13.50c
Composition Turnings	₩ ℔ 15.00@15.75c
Lead, Heavy	₩ ℔ 5.30@ 5.45¢
Tea Lead	₩ ℔ 4.90@ 5.20¢
Zinc Scrap	₩ ℔ ....@ 4.50¢
No. 1 Yard Wrought, Long	$17.00@17.50
No. 1 Yard Wrought, Short	$16.00@16.75
Wrought Pipe	$12.5 @13.00
No. 1 Machinery Cast	$15.50@16.00
Stove Plate	$11.00@11.50

THE IRON AGE

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

ISSUED EVERY THURSDAY MORNING.

Subscription, postpaid, $5.00 a year.

TWO DOLLAR EDITION, $2.00 a year; DOLLAR EDITION, $1.00 a year, to the United States, British America, Mexico, Hawaii, Cuba, Philippine Islands. OTHER COUNTRIES: Weekly Edition, $7.50; Semi-monthly Edition, $4.00; Monthly Edition, $2.50.

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